

DISSERTATION

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*Keeping the Warfighting
Edge: An Empirical
Analysis of Army Officers'
Tactical Expertise Over
the 1990s*

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RAND Graduate School

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PREFACE

Due to high rates of deployments combined with other missions, some observers argue that today's smaller Army is becoming increasingly strained in terms of how much it can do while still maintaining unit training effectiveness and personnel readiness. Interviews conducted during RAND visits throughout 1998 and 1999 to most of the warfighting brigades in the United States indicated that some commanders anticipate an eventual degradation in the tactical competence of future leaders. This was attributed both to shorter tenure in key developmental positions and fewer opportunities within those assignments to participate in field training. Others viewed the pace as quick, but believed that their subordinates were being well prepared for future responsibilities. This dissertation conducted an empirical analysis to assess whether assignment length, tactical experience, and career patterns changed over the 1990s. The results presented here represent the project's report to sponsors from our empirical analysis of possible changes in the experience base of the current officer corps.

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SUMMARY

Over the past decade, the U.S. Army has been profoundly affected by changes in military missions, repositioning and reduction of forces, and a heightened pace of deployments. This study empirically examined whether these changes, coupled with normal personnel movements through units, have limited opportunities for Army combat leaders to develop tactical skills. It explored three basic hypotheses: (1) whether the tenure of key developmental assignments became shorter between 1990 and 1998; (2) whether the content¹ of those assignments also changed in significant ways; and (3) whether earlier shifts in career patterns and training meant recent officers arrived in key positions with less experience than they had previously.

We find that while some assignments have in fact become shorter, especially for platoon leaders, on average the length of most key jobs in 1998 was about the same as it had been in 1990. Based on primary data we collected from a sample of officers serving in key positions, we find stronger evidence of significant shifts in the content of those assignments. Most notably, in 1998 field assignments for Infantry and Armor officers involved less field training (much less in the case of Armor officers) than they had in 1990. Armor officers also spent much more time deployed to operations and exercises in 1998 than they had earlier; for Infantry officers these deployments appear to have been highest in the mid-90s, and to have decreased slightly since then. Finally, there did not appear to be substantial changes in the overall career patterns of officers, except again in the case of Lieutenants, who showed a rising propensity to serve on staffs at the expense of time as platoon leaders. Taken together, these trends suggest that the tactical foundation of recent Infantry and Armor officers was weaker in 1998 than it had been previously. The effects of this degradation are

¹ Throughout this paper, the term "content" is used to mean the amount of time spent in various training and deployment activities during unit assignment. This metric of "time spent" does not include any qualitative dimension; the implications of this limitation are discussed more fully in Appendix D.

probably most serious at junior levels, as it suggests a more limited base for them to take forward to all future assignments.

Concurrent with apparent declines in tactical developmental opportunities, changes in the national security environment and the Army's resulting efforts to address these changes imply an increase in the scope of tactical skills that are required. We thus posit the existence of a tactical "gap," which, if not addressed, is likely to persist and could even grow larger.

Policy alternatives to increase tactical exposure include efforts to increase either the amount of time that officers spend in key positions or to raise the rates at which units train. We did not explore such options in depth in this study, as a thorough treatment of these alternatives was beyond the scope of this effort. We do, however, identify some steps that can be taken within the parameters of existing personnel and training policies that may increase the levels of tactical expertise for combat officers. These include options to raise the developmental value of already-scheduled training events, and to increase the number of these events for officers as individuals rather than for full units.

We conclude by arguing that the most important action the Army can take to improve the development of its officers, not only tactically but in all areas of leadership skills, is to establish a mechanism to monitor the content of unit assignments. We identify a number of alternatives for collecting relevant data, both from existing sources and by establishing new systems. Whatever its eventual form, we conclude that an improved, empirically-based system to better understand the developmental opportunities the Army provides is crucial to ensuring adequate preparation of the officer corps now and in the future.

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GLOSSARY, LIST OF SYMBOLS, ETC.

Symbol	Definition
AR	Armor
BN	Battalion
BDE	Brigade
BQ	Branch-qualified (eligible for promotion to the next grade)
CALFEX	Combined Arms Live Fire Exercise
CDR	Commander
CONUS	Continental United States
CTC	Combat Training Center
FCX	Fire Control Exercise
FTX	Field Training Exercise
IN	Infantry
JRTC	Joint Readiness Training Center, one of the four CTCs
LDP	Leader Development Program (internal unit programs to foster leader growth, typically for battalions)
Live-Fire Training	Those training events whose principal function is to train soldiers in the use and coordination of weapons systems while using live ammunition. For the purposes of this study, they included tank and Bradley gunnery, dismounted LFXs (for light Infantry assignments), company CALFEXs, and FCXs.
Maneuver Training	Those training events whose main purpose is to train the coordination of unit movements through terrain. For the purposes of this study, they included FTXs, "other" exercises (i.e., informal training), and serving as OPFOR at home station.
NTC	National Training Center, one of the four CTCs
O/C	Observer/Controller. Involves monitoring a training event, ensuring that actions meet training objectives, and critiquing the performance of those being trained.
OPFOR	Opposing Force. The set of units that plays the enemy during a training event.
OPMS XXI	The most recent version of the Army's Officer Personnel Management System, in which officer continue their careers after promotion to Major in one of four different career fields: operations, information operations, institutional support, and operational support.

OPTEMPO	Operating Tempo, typically construed in the Army as an indicator of a unit's pace of activity. Frequently measured in miles per weapons system.
PERSTEMPO	Personnel Tempo, or the pace of activity or deployments for individual military personnel.
SIM	Simulation
Strategy	"The art of developing and using political, economic, psychological, and military forces as necessary during peace and war to afford maximum support to policies and in order in war to increase the probabilities and favorable consequences of victory..." (Hanrieder and Buel, 1979: 122).
Tactics	"The employment of units in combat, including the arrangement and maneuvering of units in relation to each other and to the enemy" (Hanrieder and Buel, 1979: 125).
Tactical Exposure	The amount of time an officer is engaged in an activity deemed to build or train tactical skills.
TEWT	Tactical Exercise Without Troops
TOE	Table of Organization and Equipment ("first to the fight" units)
TDA	Table of Distribution and Allowances (organizations which operate primarily in a support role for TOE units)

(1) INTRODUCTION AND OVERVIEW

In recent years, concerns that Army officers are becoming less skilled at their craft have been voiced with growing frequency. A 1997 Congressional report, for example, quoted an Army soldier warning that "we are developing a breed of commanders who are less and less experienced at doing their thing than they ever were before" (Spence, 1997: 5). If true, this not only implies that today's officers may be less prepared for warfighting than might be desired, but that in the absence of intervention, these deficiencies will persist in the future - that we may be eating away at the "seed corn" of a competent fighting force for both today and tomorrow. These apprehensions have been shared at more senior levels as well: a 1998 memo from the Secretary of the Army to the Secretary of Defense predicted that "because today's junior officers... no longer execute the full training strategy, they will lack necessary experience when they are battalion and brigade commanders in the future" (as quoted in Clark, 1998: 1).

In the course of conducting interviews with unit commanders for a larger Army-sponsored study on issues related to "tempo" (the pace of operations and deployments), we also heard such concerns expressed frequently by many commanders. We therefore requested and received permission from our sponsor to conduct a more focused empirical inquiry into the alleged erosion of warfighting competency within the officer corps.

As part of this effort, we conducted interviews with 186 unit commanders and key staff serving in TOE Infantry and Armor² units across the United States, whose insights and perspectives helped us to refine our hypotheses and deepen our understanding of our ultimate findings. Overall, we found evidence to support the perceptions of declines in tactical training opportunities over the 1990s, though not all of the

² Throughout this paper, any reference to Armor units is intended to include Armored Cavalry units as well. Further, the terms brigade, battalion and company, when referring to Armor units, also include Cavalry Regiments, Squadrons, and Troops.

changes (particularly with respect to career patterns and the tenure of assignments) were as profound as some believed, at least in the aggregate.

Our research was deliberately narrow in scope. Though some of the issues raised above concern the concept of "leadership" more broadly, we focused on opportunities to develop tactical skills, which comprise just one part of the desired competencies for Army leaders. Thus our findings cannot be reliably generalized to allow for inferences about overall leadership abilities, but they do shed light on those in the tactical realm. Also, our data relate only to Infantry and Armor officers. We suspect that many of the trends we identify here also apply to other officer branches, at least with respect to unit activities, but additional work would have to be conducted to confirm this perception.

Nevertheless, to the best of our knowledge the research presented here represents a unique source of empirical information about changes since the end of the Gulf War in tactical developmental opportunities. While its findings may not be surprising to some, we hope that they can become part of a foundation for the Army's future efforts in leader development and offer useful suggestions for action.

There are a number of key concepts that underlie the research presented here. The next section of this chapter reviews some of the basic aspects of Army policies and organization that are integral to understanding this work. (For those more familiar with Army practices, reading this section may not be necessary.) The last section describes the basic organization of the chapters that follow.

TERMS AND CONCEPTS

Key Assignments and Career Patterns

One of the main policy areas we examined in this research was officer assignments and career patterns. Table 1.1 below describes the basic career progression for Army Infantry and Armor officers, and the assignments and schools at each grade that are required in order to be "branch-qualified," or eligible for promotion. These key positions, not coincidentally, are also those considered to be most useful in terms of teaching officers their craft. We have therefore focused on this set of

assignments throughout our analysis; a brief description of each follows.

Table 1.1: Basic Officer Career Patterns³

Grade	Years of Service ^a	Key Assignments	Key Assignment Length ^b	Required Schools
Lieutenant	0-4	Platoon Leader	12-18 months	Officers Basic Course (OBC)
Captain	4-11	Company Command	12-18 months	Captains Career Course ^c
Major	11-16	BN/BDE S3/XO	12-18 months	Command and Staff College
Lieutenant Colonel	16-22	BN Command	24 months	Senior Service School
Colonel	22-30	BDE Command	24 months	

^aThese are "due course" estimates, or the average number of years in service at which an officer becomes eligible for promotion to the next grade. However, at grades above Captain a small percentage of officers can be selected either early or within a year or two after first becoming eligible.

^bThese are the average or desired lengths for one these assignments; the most promising officers are frequently offered multiple platoon leader, company command, and/or S3/XO positions (multiple battalion and brigade commands are a great deal more rare).

^cThis is a two-phase course which consists of what was previously two separate courses, the Officers Advance Course (OAC) and the Combined Arms and Services Staff School (CAS3). These are now Phase I and Phase II, respectively, the first of which is branch-specific and the second of which focuses on staff processes.

For junior officers, platoon leader and company command assignments are their first opportunities to serve in a leadership role. During these assignments they are expected to learn how to direct and motivate others, how to employ the assets under their control in tactical situations, how to plan unit training and operations, and how to manage a fighting force in varying circumstances. Barring the exceptional case, all officers serve in both positions during their Lieutenant and Captain years.

At the Major level, to become branch-qualified in either Infantry or Armor officers must serve as a battalion (BN) or brigade (BDE) training and operations (S3) or executive (XO) officer. (Typically, an officer will serve first at the battalion level; brigade positions, and in particular the brigade XO assignment, are for the most part reserved for officers who have already served in at least one other battalion XO or S3 assignment. Further, though Majors are technically eligible to

³ Derived from Army Pamphlet 600-3, Commissioned Officer Development and Career Management (U.S. Army: Washington, DC) 1 October 1998.

serve as brigade XOs, this position is more frequently filled by a Lieutenant Colonel.) The S-3 is responsible for planning unit training during peacetime, and for planning, tracking and helping to execute the unit's battlefield operations, and keeping them coordinated with other units, during actual missions. In both peacetime and war, the XO directs the unit staff and carries out the administrative and logistic functions in support of the unit. Either or both of these assignments is considered critical preparation for eventual command.⁴

Battalion command is a prerequisite for future brigade command, and is the first level at which synchronization and coordination of multiple assets becomes a major challenge. Battalion commanders typically direct three to four "line" or fighting companies and one headquarters company that contains the staff and supporting elements. Armor and Infantry brigade commanders typically lead three Armor and Infantry battalions (most brigades have two of one and one of the other), and may also command or have operational control over other assets such as Engineers or Field Artillery. Coordination and synchronization of multiple battlefield systems continues to be a preeminent concern at brigade level, as commanders must control an even greater number and variety of forces over a wider area of operations.

TOE vs. TDA

All of the assignments above can be held in either TOE (Table of Organization and Equipment) units or TDA (Table of Distribution and Allowances) organizations. TOE units are those in the "warfighting Army," or those units whose primary focus is to prepare to quickly deploy in the event of a conflict. TDA organizations fill support roles in the so-called "institutional" Army, and include those that operate Army schools and installations, the Headquarters Army staff, etc. The distinction is particularly important for tactical development, because in general assignments in the TOE or "field" Army provide most of the opportunities for officers to train and deploy and thus employ their tactical knowledge. Some TDA positions offer these opportunities as

⁴ Though "branch-qualifying" (BQ) positions exist at each grade, in common parlance the term "BQ position" typically refers to one of these XO or S3 assignment for Majors.

well (for example, assignments as tactical instructors, as observer/controllers (O/Cs) at the Army's Combat Training Centers, etc.), but as a general proposition TDA assignments afford fewer chances to practice tactical skills. We therefore focused our analysis on assignments in TOE units, and for the most part even more narrowly to those in Infantry and Armor units in particular.

OPMS XXI

Finally, while the general career patterns outlined above are expected to remain fairly constant for combat officers in the future, the Army has recently revised its overall personnel management system in ways that may have a direct effect on some of the trends discussed in later chapters. Previously, officers in all branches competed against each other for promotion. Under the new system, termed OPMS XXI, when an officer is promoted to the grade of Major, he or she will be assigned to one of four "Career Fields" (CFs): Operations, Operational Support, Information Operations, or Institutional Support. After this point, he or she will compete only with others in the respective career field for key assignments and promotions. This is expected both to increase equality of opportunity for promotion in some branches and to allow Majors in the operations career field in particular to spend more time in branch-qualifying assignments. (Those officers in the operations career field will be responsible for "areas directly related to the employment of land forces" (OPMS XXI Final Report, 1997: ix); it is this group that corresponds to the officers we discuss in this research.) Should this latter goal be met, it would directly address the trend noted in our research of declining branch-qualifying time at the Major level.

ORGANIZATION OF DOCUMENT

This report consists of six additional chapters and five appendices. Chapter 2 describes our basic analytic framework and approach to answering the question of whether tactical expertise declined over the 1990s, and sets out our three research hypotheses. Chapters 3, 4 and 5 present the results of our data analyses testing each of these hypotheses. Chapter 5 concludes with a synthesis of the

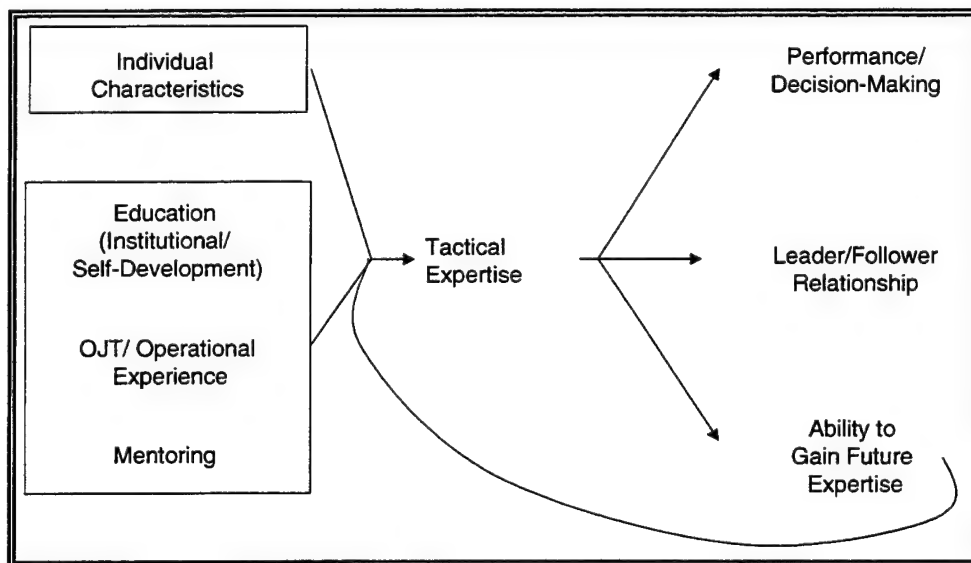
changes we observed and discusses their implications for tactical expertise. Chapter 6 presents a series of policy options the Army may want to consider both to increase officers' opportunities to develop tactical expertise and to establish a more robust system for monitoring the developmental benefit of unit assignments more generally in the future.

(2) BACKGROUND AND RESEARCH HYPOTHESES

This chapter consists of three sections. The first two describe the conceptual model upon which our research was based, tying it to the relevant literature. The last describes the hypotheses we examined, in the context of this model.

The framework for this research integrates existing theories of both expertise and leader development. Our conception is derived from several different models that posit a set of relationships, first between factors that contribute to the growth of tactical expertise, and second, between that expertise and various aspects of effective leadership and leader development. The model we developed from these theories is laid out in Figure 2.1 below;⁵ the discussion that follows will expand upon the theoretical underpinnings of each of the proposed relationships.

Figure 2.1: Building Tactical Expertise and Its Implications



⁵ The model as described here is linear and cumulative, as are the elements that we attempted to measure in our research. The development of the set of skills that are being assessed is obviously substantially more complex. This model is therefore a simplified representation of a number of highly interactive and synergistic forces.

THE DEVELOPMENT OF TACTICAL EXPERTISE

The relationships shown on the left-hand side of the figure above suggest that tactical expertise is a function of four main factors: individual characteristics, and then three "training" mechanisms (education, on-the-job training (OJT), and mentoring). Empirical research into expertise is relatively new; there is a much longer historical debate, in the military arena in particular, over whether experts (in this case tactical) are born or made. Current research indicates some support for each perspective; that is, both factors that are innate to the individual and those that are learned appear to contribute to the development of expertise in a given domain (McCall, 1997; Sashkin, 1992).

Individual Characteristics

It is clear that some individuals possess attributes that facilitate quick and easy comprehension of requisite knowledge, and a natural aptitude for synthesizing relevant information. Much research has been conducted on differences in ability and how they affect skill acquisition (e.g., Ackerman, 1993, Fleishman and Mumford, 1989, Kanfer and Ackerman, 1989), but this has principally focused on discrete skills relating to narrow sets of tasks such as manufacturing processes. For the purposes of this discussion, it is sufficient to accept that individual differences in ability affect how quickly expertise is developed, and may represent some "ceiling" on developmental potential. (In the words of one author, "not everyone has the potential to be Einstein, no matter how hard they work" (Sternberg, 1997: 353).)

The implications of these individual differences for the Army are not straightforward: for reasons of sheer institutional size, it must set policies that affect groups of officers and are thus less sensitive to individual variation. In general, the Army attempts to ensure it acquires and retains officers who meet a minimum level of learning ability, first by establishing educational standards, and second through the "sifting mechanism" of promotion boards, which take judgments from rating officers that relate to and reflect the aptitude of their subordinates into consideration.

The effects of individual ability on developing tactical skills can play out in different ways. For example, one officer may grasp basic things quickly but be less able to integrate higher-order or more sophisticated concepts. Conversely, another may take longer to master the fundamentals but be more adept at appreciating a broad set of implications and applications over time. To carry this example further, these two cases imply different things for how the Army might manage assignments. In the first instance, the fast-learning officer might derive the most benefit from the first six or twelve months of an assignment, but not develop much further despite continued time in the position. The second officer, on the other hand, might require at least twelve months in a given job before he⁶ starts to fully appreciate the lessons to which he has been exposed, but his level of sophistication might continue to increase for another twelve to eighteen months before starting to level off. A nine-month assignment, then, might exceed the optimal length for the first officer but be far below what would be ideal for the second.

This is of course a highly stylized and overly simplistic example. In reality, local commanders have some discretion in accommodating such differences. At the same time, these commanders and the Army writ large must balance the effects of low or high turnover rates that might be implied by optimizing the developmental benefit of assignments with concerns such as unit readiness and equality of opportunity across all officers. In addition, the above discussion assumes that the content of a given assignment is fairly constant, so that time in jobs serves as an adequate proxy for developmental opportunities. This dissertation challenges that basic assumption. Despite these limitations, the point remains that the individual characteristics of officers are at least one important factor in the development of tactical expertise.

Actions That Enhance Growth of Expertise

Fortunately, the Army need not rely solely on identifying and fostering those officers who are naturally best suited to mastering

⁶ Because this research focused on Infantry and Armor officers, branches from which women are by policy excluded, male pronouns will be used throughout this document.

tactical challenges. Socio- and psychological research also demonstrates that purposeful efforts to raise levels of expertise, are also effective. As one author put it, "the question is not whether extraordinary people have natural talent, but what happens that allows them to bring that talent to fruition" (McCall, 1998: 114). Others have expressed a similar sentiment, noting that "innate talent or ability only becomes expertise when it is nourished by extensive training and practice" (Richman et. al, 1996: 173). Further, what may be perceived as natural skill may in fact be due to exposure: many personal attributes that can contribute to expertise and/or leadership abilities have been found to develop over time as a result of experience (McCall, 1998: 115).

How then is expertise encouraged? Social science research has identified three principal mechanisms for building knowledge in a given domain and training leaders: classroom learning, "on-the-job" experience, and mentoring or interpersonal instruction.⁷ The Army's leader development system largely parallels this framework, with a few small modifications: mentoring is expected to be incorporated into all activities and thus is not considered to be a separate developmental forum, and officers are also expected to conduct activities on their own ('self-development') to complement formal instruction. The Army thus conceives of leader development as a system resting on three "pillars:" operational experience, institutional education, and self-development. These three activities, along with mentoring, comprise the four basic venues through which the Army attempts to affect the development of tactical expertise. The literature suggests that all of these "teaching mechanisms" are mutually reinforcing (Blake and Potter, 1992; McCall, 1998: 75), and that any individual method is likely to be buttressed by efforts in other areas.⁸ This synergy results from the fact that each

⁷ See, for example, Fiedler, 1994; Forsythe, 1992; Geier, 1992; Lambrecht et. al, 1997; Lewis and Jacobs, 1992; Marson and Bruff, 1992; Sashkin, 1992; and Stasz et. al, 1993.

⁸ The degree to which these can substitute for each other is not known, only that some combination of all of the mechanisms appears to engender the most robust results. Some examination of the question of "adequacy" (e.g., how much tactical training can be accomplished through classroom teaching, on-the-job training, or mentoring if other sources are constrained) would provide the Army with useful information about

developmental mechanism is useful in strengthening different aspects of an individual's capabilities or approach.

(1) *Education: The Institutional Education and Self-Development Pillars*

In the area of tactics, education, or "book learning," can take two forms: either directed (i.e., in the classroom) or self-guided instruction. Classroom teaching has been found to be best suited to teaching basic concepts (Lewis and Jacobs, 1992; Forsythe, 1992). Courses of instruction in such things as conducting a passage of lines or a reconnaissance patrol, for example, provide potential commanders with a variety of "tools" upon which they can draw and a basic set of rules or guidelines from which to operate when confronted with unfamiliar circumstances. On the self-directed (or what the Army terms self-development) side, efforts such as the study of military history can expand an officer's understanding of battlefield options and allow for more "visionary" thinking,⁹ while simultaneously providing a deeper understanding of tactics and technical issues, and enhancing professional confidence (Kirkland, 1990). While other activities that fall into the self-development category offer benefits in the non-tactical arena,¹⁰ from a tactical perspective careful study of past battles may be one of the most useful ways to derive lessons for the future (Evans, 1998; Livsey, 1992; Robinson, 1997: 89).

(2) *OJT: The Operational Experience Pillar*

While education is best suited to the introduction or refinement of potential options or techniques, "on-the-job" training, or the opportunity to learn through experience, has been found to be the most effective way to bring about more lasting, profound change. One psychologist has suggested that the opportunity to practice various

how to balance its leader development program, and would thus be a fruitful area for further research.

⁹ One early example is Infantry in Battle, a manual of vignettes drawn from World War I that were designed to pass on practical lessons from combat experience to those training in a more benign peacetime environment. Infantry in Battle, 1939. See also Army FM 22-103, 1987; Army FM 22-100, 1990; Ridgway, 1996; and Stokesbury, 1996.

¹⁰ Indeed, self-development frequently is conceived of as efforts to attain additional competencies or technical expertise through non-military education, volunteer work, etc.

skills could be thought of as "the successive elimination of errors" (Ohlsson, 1996). Providing a forum for the application of classroom learning to practical problems in the workplace allows people to deepen the understanding and interpretation of new knowledge.¹¹ It is also theorized to help build confidence in handling challenges on a sustained basis (Hamilton, 1990; Geier, 1992). Thus the opportunity to put theory into practice and learn its limitations is critical to establishing a strong basic foundation that can grow, with additional practice, into expertise.

The product of these two developmental methods (schooling and experience, or OJT (on-the-job training)) can perhaps be thought of most clearly in terms of the education principally providing information about "what" to do, while experience offers insights into the "how" of getting things accomplished (Dreyfus, 1996: 22-23). Process or "how" knowledge is sometimes referred to as "tacit," and is believed to increase with experience in a given domain (Halpin, 1995). Those in authority need knowledge of both the whats and the hows, but competence in the latter is likely to be more flexible and adaptive over the long term.

(3) *Mentoring*

The final element of fostering expertise in a given domain is mentoring. This indirect transfer of experience from one person to another enriches the meaning of situations and broadens the context in which they can be understood (McCall, 1998). The Army recognizes this fact, and is explicit in its doctrine about the requirement and responsibility for leaders to mentor their subordinates.¹² Officers have repeatedly confirmed the importance and value of mentoring (Jacques et. al, 1986; Results, 1985), but it has long been noted that the level of mentoring that actually takes place is inadequate (Jacques et. al,

¹¹ For example, in the civilian world, managers report that opportunities to "practice" during different jobs help to develop strategic thinking, ensure results, shift organizational culture, employ empowering behaviors, and strengthen a customer orientation (Benjamin, 1997).

¹² See, for example, Institutional Leader Training and Education, TRADOC Regulation 351-10, 1997; and TRADOC Pamphlet 525-100-2, Leadership and Command on the Battlefield, 1993.

1986; Kirkland, 1990; Stroup, 1996; Ulmer, 1998). While we did not collect empirical data about mentoring during the course of this research, we did ask in our interviews whether officers felt that they were receiving the mentoring they needed, and whether they felt that they were able to mentor as much as they should. In many cases, the answer to both questions was no. One 1992 study found that one reason for a lack of mentoring was confusion about what the actual process entailed (Stewart, 1992); this problem was evident in some of our interviews, but officers also cited constraints on time, motivation, and, in some cases, a lack of sufficient knowledge themselves. Fortunately, the Army leadership recognizes that this element of leader development needs to be strengthened, and is exploring options to do so.¹³

While more research is needed about teaching specific leader skills and the mechanisms that provide the most transformative results, current evidence supports the belief that both instruction and hands-on experience can positively affect the construction of expertise (Clark et. al., 1992; Sternberg, 1997). In combination with natural attributes, these purposeful interventions can foster the development of tactical expertise for Army officers.

IMPLICATIONS OF TACTICAL EXPERTISE FOR LEADERSHIP AND LEADER DEVELOPMENT

While some may view the benefits of tactical expertise as self-evident, it is useful to explicitly review the importance of this expertise as it specifically relates to leadership and the overall process of leader development. The right-hand side of Figure 2.1 presented earlier depicts three of the main implications of tactical expertise for these areas. First, research indicates that levels of expertise affect how well people make decisions, especially under stressful conditions (Fiedler, 1992; Halpin, 1995). Second, tactical expertise has an impact on the relationship between a leader and his followers; greater expertise facilitates trust in a commander's judgment, contributing to a more successful leader/ follower

¹³ Author's conversations with Army Staff, Office of Deputy Chief of Staff for Personnel, Fall 1998.

relationship. Finally, to some extent expertise begets expertise (Anderson, 1987: 203); that is, proficiency allows for the development of increasingly sophisticated mental models and increases developmental capacity, while novice-level understandings inhibit full realization of the developmental benefit of a given experience.

(1) Performance/ Decision-Making

Tactical expertise derived from practice is particularly important to the decisionmaking process, especially in a military context.¹⁴ Psychological research has identified two primary models of how people arrive at decisions: algorithmic or rational, and heuristic (Armour, 1994; Zsombok and Klein, 1997). Algorithmic models are rule-based, and involve identifying all possible options, then systematically evaluating each in turn. While algorithmic models typically provide robust solutions, they can be time- and resource-intensive. Heuristic or experiential decisionmaking, on the other hand, relies on trying to match the current situation to one in the past, judging probabilities of events, and/or forecasting or mental simulation. These models are typically faster and more adaptable than rational processes, but can be unreliable if the range of experience that the individual is drawing upon is too narrow to allow for sound decisions.

Of particular interest to the Army is the finding that as situations become more stressful (as would be expected in combat), people tend to rely more heavily on their experiences (i.e., "gut feel," or "instinct") and less on rational decisionmaking processes (Fiedler, 1990. 1994; Klein et. al, 1990). Even in non-stressful situations, as expertise grows people become more intuitive in their responses, having built more complex and complete mental models (that are also faster) to address given situations (Serfaty, et. al, 1997: 242-243). If commanders are likely to rely on heuristic models anyway, the Army may have an interest in trying to broaden the experiential base that commanders draw from in an effort to improve the quality of their tactical decisions.

¹⁴ Wass de Czege and Biever, 1998; TRADOC Pamphlet 525-100-2, 1993. Armour also credits self-study with broadening one's heuristic base; thus it may be that both self-development and OJT can contribute in this area (Armour, 1994).

(2) Leader/Follower Relationship

Closely related to an officer's ability to make appropriate tactical decisions is the effect that this expertise, when recognized, can have on a commander's relationship with subordinates. As the scope of an officer's responsibility grows with successive appointments at higher echelons, he gains larger numbers of followers who must trust that his tactical judgment is sound. The perception of a leader's expertise, in combination with the skills and talents of subordinates, has been found to enhance the impact of supportive leadership (Dorfman et. al, 1992), improving group outcomes. In another study of what constituents valued in their leaders, competence was second only to honesty as the most frequently mentioned characteristic. This competence was a critical factor in the leaders' credibility (Kouzes and Posner, 1996), which in turn is integral to improving performance. Contrary to the conception held by some that "good leadership" can independently improve results, in fact there is an interaction that is far more complicated which rests on the quality of the relationship between the leader and the led (Heifetz, 1994; McCall, 1998). Thus subordinate attitudes and perceptions, rather than (or in conjunction with) leader behaviors and attitudes, are in fact the true determinants of performance (Dorfman et. al, 1992), and trust between leaders and followers is a critical element of that relationship. When lives are on the line, trust in the commander's tactical expertise is crucial to unit integrity and to the faithful execution of the leader's directives.

(3) Improved Ability to Gain Additional Expertise

Finally, tactical expertise is not only related to the ability of an officer to serve as an effective commander and leader, but also has an impact on the further development of that officer's tactical skills. Prior knowledge in a given domain has been shown to have significant effects on the acquisition of knowledge in new situations: it allows people to transfer problem-solving mechanisms, interpret new information with greater sophistication, and make more productive use of weak problem-solving mechanisms such as analogies (Anderson, 1987: 206). In retaining new information, experts also are more efficient in that they tend to develop and utilize lines of reasoning that take more of the

relevant information into account and ignore information that is less helpful (Hassebrock, et. al., 1993; Serfaty, et. al, 1997). Thus if an officer has a narrow tactical base, especially early in his career when he has little other experience with which to supplement his tactical knowledge, he is less likely to be able to derive or retain all of the appropriate lessons from current and future experiences. This effect can be mitigated, at least to some degree, by actions such as increasing exposure to certain kinds of events or through intensive mentoring, but it is easier for the officer who initially confronts a situation with an already sophisticated understanding of the underlying principles at work to expand upon and deepen that knowledge, without additional intervention. Entering at a higher skill level increases peoples' ability to evaluate their own performance, and raises their level of achievement (Glaser, 1996: 305). Thus if a strong tactical foundation is laid at the Lieutenant and Captain level, officers are best equipped to make the most of later opportunities.

RESEARCH HYPOTHESES

This basic model describing how tactical expertise is developed and the importance of that expertise for the success of Army leaders is the foundation for the specific questions we addressed in this research. Our model suggests that lower levels of tactical expertise would have at least four main implications for the Army's leaders and its leader development system.¹⁵ First, if tactical expertise has declined recently, as has been suggested not only in our interviews but in recent Congressional testimony as well¹⁶, this suggests that should today's

¹⁵ There are other implications that do not relate directly to leader development, but instead to unit readiness and/or morale. For example, in our interviews we were told that lower levels of tactical proficiency in non-primary unit staff members had increased the workload for more senior officers in some units. Although we did not attempt to measure this phenomenon empirically, some officers reported that compensating for these experiential deficiencies was straining more experienced officers, was frustrating to junior officers who were in many cases aware of their lack of knowledge, and was occasionally having a negative impact on the quality of unit training events.

¹⁶ Fewer opportunities to engage in tactical "practice" were noted in a series of hearings in 1999, during which the commanding general of the National Training Center (NTC) testified that from his perspective,

officers be called upon to conduct a war, their tactical decisions would be less reliable, especially at junior levels, than were those of the officers who successfully prosecuted the Gulf War in 1991. Second, if the tactical expertise of current officers has in fact declined, the ability of this group of officers to engender the trust of their subordinates, critical in battle, could be more tenuous than it was for officers in similar positions earlier in the decade. Third, officers with lower levels of expertise would probably have derived less tactical benefit from subsequent opportunities than did their predecessors, amplifying the first-hand effects of experience shortfalls. Finally, officers with less expertise would be less prepared to train their subordinates effectively, which could potentially create a snowball effect in which each subsequent generation of officers becomes less tactically knowledgeable than the last.

For these reasons, we believed that the possible impact of declining tactical expertise could be quite grave. In our evaluation of the alleged problem, however, we did not attempt to address all of the factors that contribute to developing that expertise. Instead, we focused on operational experience, as measured by time spent participating in the 'deliberate practice' of tactical skills during training events. Limitations of this approach are discussed more fully in Appendix D, but the basic intent was to gather empirical evidence about whether training opportunities (as an approximation of tactical expertise) have declined over the last decade.

There were three basic reasons that we limited ourselves to an evaluation of the operational experience portion of our conceptual model presented earlier. First, our initial interviews with unit commanders revealed widespread and persistent beliefs that this aspect of the leader development system, more than any other, had changed over time.

"units have had less training time, less money, more deployments, and less experienced leaders, so their entry level of training is lower than it was 6 or 7 years ago" (Webster, 1999). The 7th Army Training Command Commander in Europe seconded this view, reporting that "units increasingly experience difficulties in synchronizing and sustaining combat operations... [and that u]nits were found weakest in areas that they could not train due to lack of resources and/or personnel" (Casey, 1999).

Second, developmental theory¹⁷ led us to believe that opportunities for deliberate practice are the most important mechanism through which tactical expertise is developed, and that neither formal schooling nor self-development were likely to be perfect substitutes for the tactical lessons derived from putting doctrine into practice. Finally, we faced some resource constraints: the magnitude of the effort required to obtain some measure of training opportunities, relative to the manpower we had available to devote to the effort, precluded us from a broader evaluation of all the factors that contribute to fostering tactical expertise.

These same resource constraints also led us to limit our research to Infantry and Armor officers, rather than the whole Army or even all the combat arms branches.¹⁸ This focus was further warranted by the high premium on tactical expertise for combat arms officers, because of their expected roles in directing warfighting operations. Finally, it reflected the frequency with which concerns were cited regarding tactical expertise in Infantry and Armor units in particular during in our unit interviews.¹⁹

In order to evaluate training opportunities, we looked at the two major factors that we believed provided reasonable bounds on those experiences. Our conception was that training opportunities are principally a function of two variables: first, officers have to be assigned to units in which hands-on tactical training is most likely to occur; second, those units must actually conduct training events. We thus looked both at officers' assignments, and at the content of a subset of those assignments, those in the Army's ground maneuver

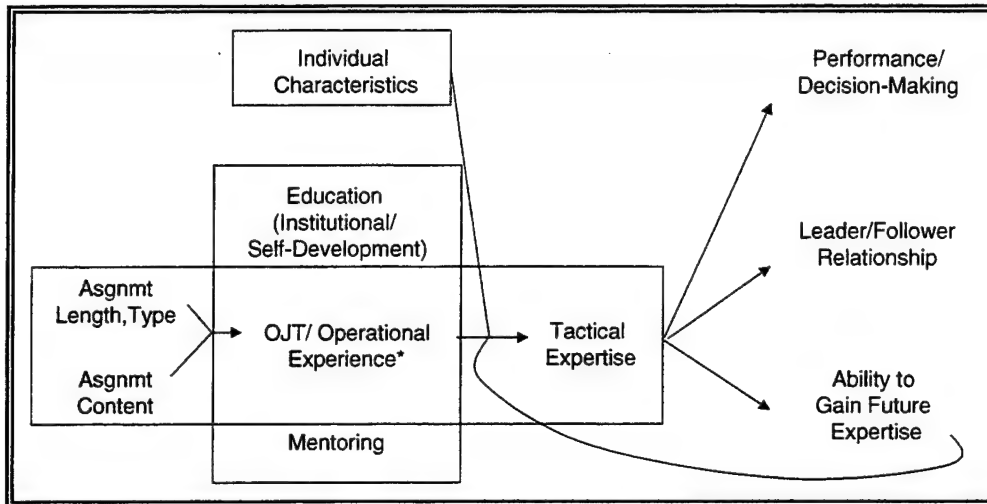
¹⁷ E.g., Halpin, 1995; Lambrecht, et. al, 1997; Marson and Bruff, 1992; McCall, 1998; and Stasz, et. al, 1993.

¹⁸ In addition to Infantry and Armor, the combat arms include Air Defense Artillery, Aviation, Engineers, and Field Artillery.

¹⁹ It was also pointed out to us repeatedly that similar developmental concerns may hold for non-commissioned officers as well. Our visits to numerous units did not give us any evidence to the contrary; unfortunately, such an investigation was well beyond the scope of what our resources made possible.

brigades.²⁰ Relating this back to our earlier figure, our research therefore focused on the shaded areas depicted in Figure 2.2 below.

Figure 2.2: Research Focus



Viewing training opportunities as a function of these two variables (key assignments and their content), we explored three basic hypotheses:

- **Research Hypothesis 1:** The tenure of key assignments (i.e., those thought to be most useful in the development of tactical expertise) had gotten shorter over the 1990s;
- **Research Hypothesis 2:** Within these assignments, there were fewer opportunities to engage in training events than there were earlier in the decade; and
- **Research Hypothesis 3:** Recent officers arrived in key assignments with less tactical expertise than they had had in the early 1990s.

The next three chapters will describe our data sources, and present the results of our analysis testing each of these three hypotheses in turn.

²⁰ These units are also referred to in this paper as "warfighting brigades," and include all active duty Infantry or Armor brigades in the TOE (Table of Organization and Equipment) Army.

(3) LENGTH OF KEY ASSIGNMENTS

As mentioned above, our investigation of experience included both an overall analysis of officer assignment patterns, and an assessment of the content of a subset of those assignments (those considered most likely to be tactically intense and/or beneficial). In our analysis of individual assignments, we evaluated the assertion that had arisen frequently in our interviews that the length of key assignments in warfighting units had gotten shorter over the 1990s. Some of the officers we interviewed told us that outside pressures (attributed to higher echelons that stretched from the brigade level to the entire institutional Army) were driving the length of branch-qualifying (BQ) assignments for Majors, Captains, and Lieutenants²¹ toward the minimum (and sometimes below the minimum) bounds set by Army guidelines,²² a marked change from the past. Shorter assignments were reportedly reducing officer participation in key training events - and in some cases precluding exposure to some types of exercises altogether.

Our analysis suggests that there is empirical support for these observations in some cases, although perhaps not as much as some might expect. The most significant findings of our assignment length analysis were:

- Decreases in the amount of time all officers, especially Infantry officers, spent in platoon leader assignments, plus strong indications that the gap in total platoon leader time between past and more recent Lieutenants will grow wider in the future;

²¹ Again, these jobs are: for Lieutenants, platoon leader assignments; for Captains, company commands; and for Majors, battalion S3 (operations and training officer) or XO (executive officer), or brigade S3 or XO assignments. Each is expected to be held for a minimum of 12 months. (There are some additional positions that are, or have been in the past, technically considered to be branch-qualifying, but the incidence is sufficiently rare that the discussion here will only include the assignments listed above.)

²² These are outlined broadly in the Army's Pamphlet on career patterns (DA PAM 600-3, 1995), and are supplemented by policy guidelines set by the Army's Personnel Command and by individual branches.

- Little change in the average length of company commands, aside from a slight increase between 1990 and 1998 in the length of first-time commands for Infantry officers; and
- Shorter assignments for first-time battalion XOs, and for Infantry officers, for battalion S3s as well; also, a significant decline in the percentage of battalion S3s and XOs who had had prior S3 or XO experience upon which to draw.

A more detailed explanation of these findings is provided below. First, however, the next section of this chapter describes the data we used to complete this analysis, and some of the challenges we faced in using them. The chapter then turns to a more complete description of the changes in assignment length for Infantry and then for Armor officers, and concludes with a synopsis of our results.

DESCRIPTION OF THE DATA

To test the hypothesis that key assignments had become shorter over time, we used information contained in the Army's main personnel file for officers, the Officer Master File (OMF). Ideally we would have liked to make comparisons between multiple points over time. However, issues of data quality precluded our ability to reliably examine any more than two dates, 1990 and 1998.²³ The data from these two years were used to inform two separate analyses, the hypothesis addressed in this chapter (Research Hypothesis 1, that key assignments had become shorter) and the hypothesis addressed in Chapter 5, that officers recently serving in key positions had brought less tactically-relevant experience with them into those jobs than had been typical in the past (Research Hypothesis 3).

Extracting information to support these analysis from the OMF required clearly identifying assignments by type and duration, which

²³ We chose 1990 as our base year for comparison because the experiences at this point in time represent the experience levels of the set of officers who successfully prosecuted the United States' last major war. In choosing this year, we also hoped to avoid distortions that may have been caused by the stop-loss policies (where officers were "frozen" in assignments) associated with the Gulf War. These policies were expected to have lengthened assignments for officers who would have left their jobs in 1991 and 1992, for the most part, which are the two years following the data we used here. As for the latter year, we chose 1998 because it was the most recent complete calendar year.

involved a series of steps: first, recoding a free-form data field that contained a duty or position title into a smaller set of usable categories of assignments; second, determining whether the unit of assignment fell into one of three groups (Infantry or Armor, other TOE, or TDA); and third, revising and correcting assignment durations when they appeared to be in error (for example, when the start and end date of what appeared to be sequential assignments overlapped). Appendix A details each of these steps further.

Initially we had hoped to be able to "clean" the files for all of the Infantry and Armor officers who were in the active duty force at the two points in time. However, it became clear that attaining a high degree of reliability would require reviewing each record individually. We thus focused on an even smaller but still robust subset of the data, and directed our efforts toward ensuring accuracy within this subset.

Our ultimate data set included the assignment histories of officers who had departed a key position in an Infantry or Armor unit (i.e., platoon leader, company commander, or battalion or brigade S3, XO, or commander)²⁴ at any point during calendar years 1990 or 1998.²⁵ The information about their most recent assignment of one of these types was used to test whether there had been changes in the average lengths of these positions (Chapter 3), while their entire assignment histories were used in our analysis of career patterns in Chapter 5. (The unit of analysis for the information presented in this chapter is a single assignment.) To ensure we captured the full calendar year (as there is sometimes a lag in updating the personnel records), we extracted the assignment information in February of the year following the year of interest (i.e., 1991 and 1999). Our data set did not include the assignments of those officers who had left other positions, nor those

²⁴ This list of "key positions" was derived from extensive discussions with subject matter experts both within and outside the Army. Our intent was to capture those positions which were likely to make the greatest contributions to tactical expertise, while at the same time keeping the number of those positions to a manageable minimum.

²⁵ This subset represented 19 percent of all active duty officers in 1990, and 17 percent in 1998. Additional detail about included records is provided in Appendix A.

who were currently serving in one of our assignments of interest at the time of the OMF extracts.²⁶

Because we extracted assignment histories for only a portion of officers, we are unable to answer some potential questions of interest, such as whether there had been a more recent shift in the total amount of time that officers were spending as, for example, platoon leaders or company commanders.²⁷ As noted above, it is possible that an officer left one such assignment and went into another, for which he would not be given "credit" under our approach. This chapter includes an analysis of the proportion of officers with prior experience in like jobs, which, although it does not completely capture changes in the total amount of time spent in a given type of position, does provide an indication of whether these total levels are likely to rise or fall in the future. Further, the analysis of career histories in Chapter 5 does include a slightly less recent look at changes in total time spent in certain types of jobs. For example, the comparison of outgoing battalion S3s discusses whether total company command time in the early 1980s (when S3s in 1990 were likely to have served in such jobs) differed significantly from total company command time in the early 1990s (when outgoing S3s in 1998 would have held these positions). This can be viewed in conjunction with the more recent information on the length of

²⁶ In some cases, officers left one key assignment but went directly into another of the same type (e.g., from one platoon leader position into another). If the first assignment ended in calendar year 1998 and the second in calendar year 1999 (or had not yet ended by the time we took our extract in February 1999), the officer was included in the analysis and his history was evaluated up through the assignment that ended in 1998. If the first platoon leader assignment had ended in January 1998, for example, and the second had been ten months long (thus concluding in October of that year), the officer was included in the analysis, with his history up through the platoon leader assignment that ended in October.

²⁷ This is because the best time to capture total time as platoon leaders, for example, would likely be at promotion to Captain, or at the end point of a typical three-year tour on a given post; capturing all company command time might involve evaluating career histories at promotion to Major. Unfortunately, officers at these points were not included in the final, cleaned data file used for this analysis. To answer such questions, it would have been useful to have been able to utilize the entire OMF extract; however, the amount of effort required to ensure a minimum level of data quality precluded this possibility.

first and second commands presented in this chapter in order to derive an indication of the trends in total company command time.

To reiterate, the data presented in this chapter are not indications of total average lengths of time in given positions. The fact that an officer in 1998 left a company command after 11 months, for example, does not mean that he will have only 11 months total time as a company commander by the time he becomes a battalion S3. However, comparing the lengths of single assignments, when coupled with information about proportions of officers who hold such jobs once and more than once, allows for an understanding of how much time a given group of officers could reasonably be expected to get in various positions, as well as how that time is distributed among them.

ANALYSIS RESULTS

In some cases, our interviews led us to expect larger changes in career patterns than were borne out by the OMF data; in others, the data appeared to support perceptions in the field that assignment length had indeed become a developmental concern. As an example of the first case, there were no statistically significant declines²⁸ in the average length of the most recent²⁹ company commands - instead, the length of first-time company commands for Infantry officers actually increased. This is contrary to the beliefs held by some officers in field units, who reported an increasing occurrence of very short company command tours.

There are at least three possible explanations for this disconnect. First, it may be that the circumstances limiting the length of assignments in some units in 1998 and 1999 (when we conducted our unit visits) also existed in 1990, but that the officers we spoke with who perceived their current environment as different had not been in situations earlier in the decade where they would have been exposed to the same circumstances they now viewed as suboptimal. Thus the

²⁸ Throughout this paper, when statistical significance is discussed the hypothesis tested was that the independent variable (time) had no effect on the dependent variable (assignment length, field training content, etc.).

²⁹ In general, the term "most recent" is used to mean the most recent key assignment that an officer held that ended in either 1990 or 1998 and that therefore caused him to be included in our data set.

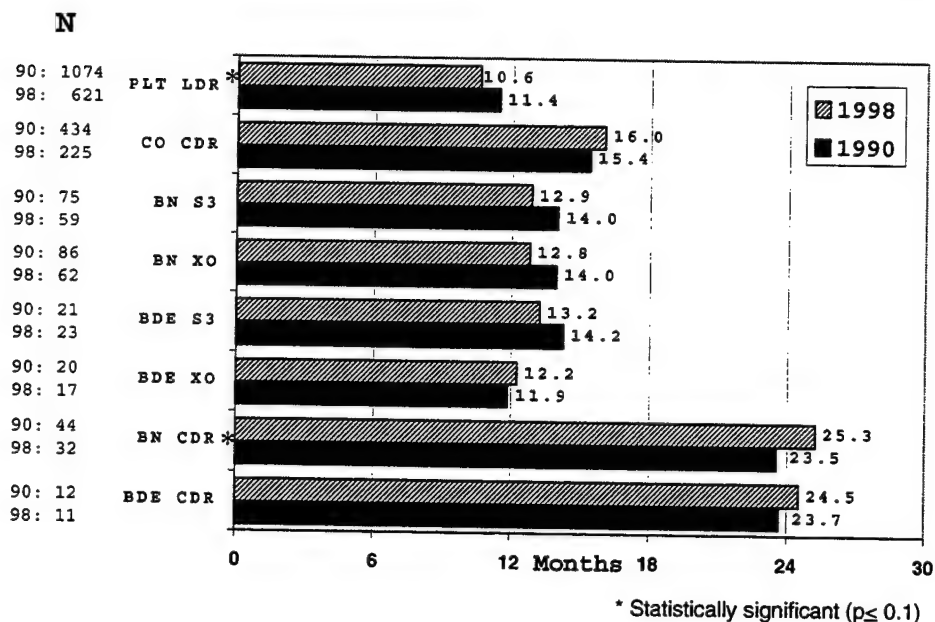
perception could be based on a change not in reality, but in perspective. A second possibility is that while some company commanders in 1998 served less time in position than they did in 1990, others served much longer, so that the average remained roughly constant. An evaluation of the changes in the distribution of assignment lengths is included for the interested reader in Appendix B. Overall, however, it appears that for most assignment types there was less variance in assignment lengths in 1998 than there had been earlier. Finally, it may be that assignments have indeed become shorter, but only as compared with intervening years, which would not be evident from our two data points. In other words, if key positions lasted longer during the mid-1990s, but became shorter since then, this would not be apparent in our comparison with 1990; however, such a shift could certainly give rise to (what would be accurate) perceptions that assignment lengths have declined.

We remain, however, interested in whether officers who departed a key job in recent years had less time in that position to derive tactical lessons than did like officers in 1990, a group that is assumed to be representative of those who successfully prosecuted the Gulf War. The next two sections address this question, first for Infantry officers and then for Armor.

Infantry Officers

Figure 3.1 depicts the average length of key assignments in Armor or Infantry units for Infantry officers who left one of these positions in 1990 or 1998. In general, it shows that more senior-level positions got slightly longer over time, while mid-grade and junior positions (with the exception of company commands) became shorter.

Figure 3.1: Average Length of Key Assignments (IN Officers)



Many of these changes are small enough to be potentially attributable to random variation. Table 3.1 below presents some of the same information depicted in the figure above, but also indicates which changes are statistically significant (i.e., highly unlikely to be due

Table 3.1: Changes in Assignment Length (IN Officers) (Months)

	Avg. Length			Avg Length (1st Pos)			Avg Length (2+ Pos)			Pct 2+ Pos		
	1990	1998	% Δ	1990	1998	% Δ	1990	1998	% Δ	1990	1998	Δ
PLT LDRs	11.4 (N=1074)	10.6 (N=621)	- 7.0*	12.7 (N=524)	11.4 (N=332)	-10.2*	10.2 (N=550)	9.6 (N=289)	- 5.9	51.2	46.5	- 4.7*
CO CDRs	15.4 (N=434)	16.0 (N=225)	+ 4.0	15.7 (N=302)	16.8 (N=153)	+ 7.0*	14.7 (N=132)	14.5 (N=72)	- 1.4	30.4	32.0	+ 1.6
BN S3s	14.0 (N=75)	12.9 (N=59)	- 7.9	14.2 (N=63)	12.8 (N=55)	-9.9*	13.0 (N=12)	14.0 (N=4)	+ 7.7	16.0	6.8	-13.2*
BN XOs	14.0 (N=86)	12.8 (N=62)	- 8.6	14.5 (N=46)	12.9 (N=46)	-11.0*	13.3 (N=40)	12.6 (N=16)	- 5.3	46.5	25.8	-20.7*
BDE S3s	14.2 (N=21)	13.2 (N=23)	- 7.0	14.3 (N=6)	17.0 (N=5)	+ 18.9	14.2 (N=15)	12.2 (N=18)	-14.1	71.4	78.3	+ 6.9
BDE XOs	11.9 (N=20)	12.2 (N=17)	+ 2.5							93.4	100	+ 6.6
BN CDRs	23.5 (N=44)	25.3 (N=32)	+ 7.7*	24.7 (N=36)	25.1 (N=28)	+ 1.6	18.5 (N=8)	26.0 (N=4)	+28.8*	18.2	12.5	- 5.7
BDE CDRs	23.7 (N=12)	24.5 (N=11)	+ 3.4									

to chance) and distinguishes between averages for officers who were serving in a position for the first time and those who had previously

held at least one prior assignment of the same type.³⁰ The final set of columns in the table indicates the percentage of officers in each year who were leaving their second or later assignment of that type, in order to give some sense of changes in the opportunity for repeat assignments in key positions.

As mentioned above, the table indicates which differences are statistically significant (at the 10 percent level³¹): in such cases, the cells are marked with asterisks in the "percent change" column and the numbers are in bold. The chart makes clear that at the aggregate level (the first set of columns), there were very few changes between 1990 and 1998 in the length of key assignments: only the seven percent (0.8 month) decrease in platoon leader assignments and the eight percent (1.8 month) increase in battalion commands.

Further stratification of these averages produces evidence of significant declines (each about 10 percent) in the length of first-time platoon leader, battalion S3, and battalion XO assignments. In addition, for each of these positions, the opportunity to serve in more than one such assignment declined, especially at the battalion level. The combination of these changes means that officers who left their first of one of these key assignments in 1998 not only had less time in that job, but were also less likely to supplement this experience with an additional assignment of the same type in the future. Thus while in 1990, 49 percent of all Lieutenants were likely to get only 12.7 months as platoon leaders, by 1998, 53 percent were likely to lead only one platoon, for an average of 11.4 months. This suggests that as the 1998

³⁰ When designating repeat assignments, battalion and brigade S3 and XO positions are treated as a group, as all are "branch-qualifying" (BQ) assignments. Thus those serving in their second or more assignment for one of those positions signifies not that they had held the same job earlier (e.g., a battalion XO with an earlier battalion XO assignment), but that the officer had held an earlier BQ assignment that could have been any of the four (e.g., a battalion XO who had previously been a battalion S3). In the Tables 3.1 and 3.2, information for repeat brigade XOs and commanders was not included because they accounted for less than 20 percent of outgoing officers in both years.

³¹ This means that there is at most a ten percent chance that the observed change in assignment length occurred because of random variation around an unchanged mean.

group of platoon leaders advances, a larger proportion of them will have a weaker tactical foundation than had been the case in 1990.

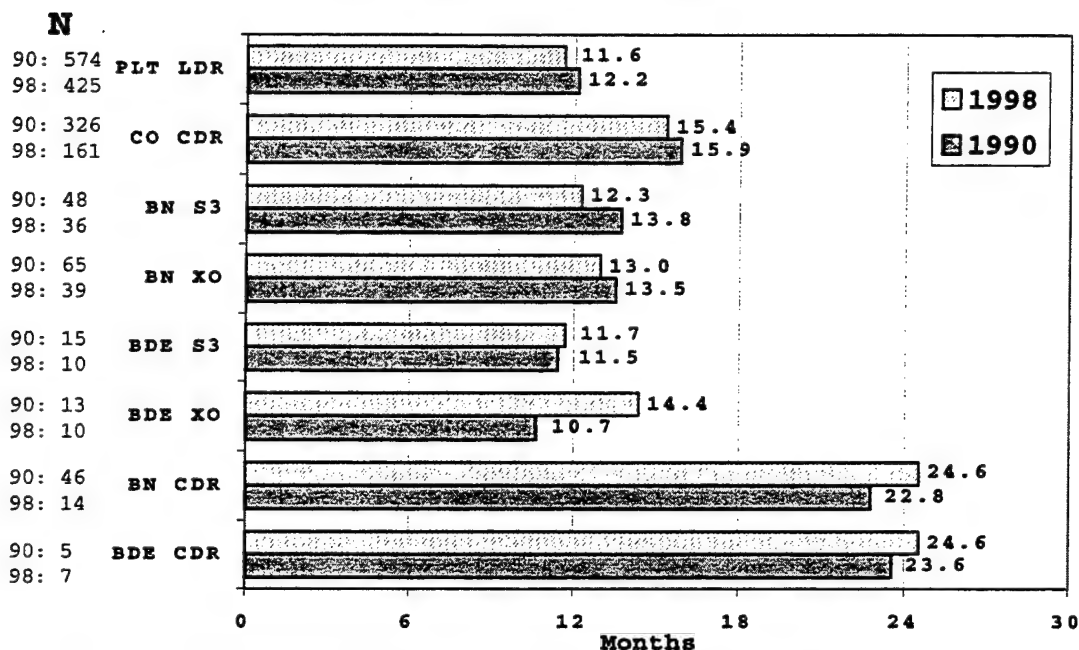
For battalion S3s and XO's, the trends are even more stark. On the positive side, though the average assignment for first-time S3s and XO's fell by about six weeks, this still exceeded the 12-month minimum goal by about a month. However, in 1990 62.5 percent of all Majors leaving one of these jobs had held at least one earlier BQ assignment; by 1998, this had fallen to 32.6 percent of all outgoing S3s or XO's. That is, two-thirds of battalion S3s and XO's in 1990 had the opportunity to derive richer tactical lessons from a second BQ position (because of prior BQ knowledge), while only one-third in 1998 had this advantage.

There are some additional indirect implications of this shift. The most important may be that the younger officers in 1998 were in battalions with a less-experienced group of Majors overall, which likely affected not only the quality of the tactical coaching, teaching, and mentoring those younger officers received, but may also have had an impact on the overall quality of the training events that took place during their tenure. The Army has recently modified its personnel system to address the problem of shorter BQ time for Majors (e.g., OPMS XXI and its associated policies); these changes should help to alleviate some of these problems. Nevertheless, for the junior officers who already passed through some of their most important developmental positions under the conditions described here, the experiences they missed cannot be regained.

Armor Officers

As was the case for Infantry officers, in general the length of key assignments for Armor officers increased for more senior positions between 1990 and 1998, and decreased at more junior levels (see Figure 3.2 below).

Figure 3.2: Average Length of Key Assignments (AR Officers)



None of these differences in overall averages were statistically significant. However, as Table 3.2 shows, the length of first-time platoon leader and battalion XO assignments did fall by a significant amount.

Table 3.2: Changes in Assignment Length (AR Officers) (Months)

	Avg. Length			Avg Length (1st Pos)			Avg Length (2+ Pos)			Pct 2+ Pos		
	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	Δ
PLT LDRs	12.2 (N=574)	11.6 (N=425)	- 4.9	12.3 (N=321)	10.1 (N=241)	-17.9*	10.1 (N=253)	10.7 (N=184)	+ 5.9	44.1	43.3	- 0.8
CO CDRs	15.8 (N=326)	15.4 (N=161)	- 2.5	16.2 (N=246)	16.0 (N=112)	- 1.2	14.9 (N=80)	14.1 (N=49)	- 5.4	24.5	30.4	+ 5.9
BN S3s	13.8 (N=48)	12.3 (N=36)	- 10.9	13.9 (N=42)	12.5 (N=34)	- 10.1	13.0 (N=6)	8.0 (N=2)	- 38.5	12.5	5.6	- 6.9
BN XOs	13.5 (N=65)	13.0 (N=39)	- 3.7	16.1 (N=31)	13.5 (N=32)	-16.1*	11.2 (N=34)	10.7 (N=7)	- 4.5	52.3	18.0	-34.3*
BDE S3s	11.5 (N=15)	11.7 (N=10)	+ 1.7	9.0 (N=2)	8.5 (N=2)	- 5.6	11.8 (N=13)	12.5 (N=8)	+ 5.9	86.7	80.0	- 6.7
BDE XOs	10.7 (N=13)	14.4 (N=10)	+ 34.6							100	90.0	- 10.0
BN CDRs	22.8 (N=46)	24.6 (N=14)	+ 7.9	23.7 (N=39)	24.8 (N=13)	+ 4.6	17.6 (N=7)	22.0 (N=1)	+ 25.0	15.2	7.1	- 8.5
BDE CDRs	23.6 (N=5)	24.6 (N=7)	+ 4.2									

Of greatest concern is that Lieutenants leaving their first platoons in 1998 spent an average of only ten months in those assignments, well below the 12- to 18-month objective set by Army policy. When averaged across the 241 Lieutenants who left their first platoons in 1998, this decline represents a loss of 44 man-years of platoon leader experience. And, although opportunities for subsequent

platoon leader assignments remained constant between 1990 and 1998, about 55 percent of these Lieutenants are not likely to lead another platoon. These trends suggest that future examinations of total platoon leader time will reveal evidence of serious declines.³²

Given current assignment practices, almost all of these Lieutenants are likely to be promoted to Captain if they remain in the Army, and therefore most will go on to command companies. Developmental theory suggests that they are not likely to derive as much tactical benefit from future commands as had earlier cohorts who had had more platoon leader experience to draw upon, as starting with a weaker foundation constrains what can be learned from subsequent opportunities. Thus the 1998 group of Armor platoon leaders is probably tactically weaker than were like officers in 1990, and their deficiencies may not be fully redressed by future opportunities.

First-time battalion XO's in 1998 also served for shorter periods of time, though again their average tenure exceeded the 12-month minimum target. As with Infantry officers, these first-time BQ officers accounted for a much larger proportion of Majors leaving BQ jobs in 1998 than they had in 1990: over half of all XO's had served in earlier BQ assignments in 1990, compared to just 18 percent in 1998, signifying a sharp decline in the opportunity to serve in repeat BQ positions. Together with battalion S3s, almost two-thirds of battalion level BQ Majors had had prior BQ experience in 1990; this fell to less than one quarter by 1998. Again, this suggests not only weaker experience bases for these officers as they progress, but also the potential of lower-quality tactical experiences for the junior officers who served under them in 1998.

³² Falls in time as platoon leaders appear to be recent; as analysis presented more fully in Chapter 5 will show, Armor officers exiting their second or more platoon in 1998 had spent about the same amount of total time (just over 23 months) in all of their platoon leader assignments thus far as had similar Lieutenants in 1990. This does not necessarily represent a complete picture of platoon leader time, as some may go on to subsequent platoons, but it is rare to lead three or more. Thus declines in total time were not yet obvious in 1998. (While earlier platoon leader assignments for those leaving their second such position in 1998 were on average shorter than they had been in 1990 (13.5 vs. 12.1 months), this difference was not statistically significant.)

(4) TRAINING CONTENT OF KEY ASSIGNMENTS

Our theoretical model presented in Chapter 2 postulates that opportunities to "practice" warfighting skills are constrained not only by the amount of time a given officer spends in TOE unit assignments (where most training is assumed to occur), but also by the level of unit activity. Our second research hypothesis addresses this latter concern -- that, irrespective of the personnel system and assignment patterns, the training levels in warfighting (i.e., TOE Infantry and Armor) brigades fell over the 1990s, resulting in fewer opportunities for officers to enhance their tactical expertise through OJT.

Because some information about officers' careers is available from personnel records but information about the content of unit assignments is more difficult to obtain, it is convenient to assume that knowledge of the types and duration of positions in which an officer has served is an adequate proxy for the likely experience base of that officer.³³ However, many of the officers we interviewed challenged this assumption; as one battalion XO put it, "[a]ctivities within a year are different than they used to be. We spend less time at the NTC (National Training Center), do less gunnery, have fewer brigade ARTEPs (Army Training and Evaluation Program field training exercises), and don't do any more border patrols (in Germany)."³⁴

³³ To be fair, an officer's evaluations, which exist for every assignment, also serve as a subjective source of information about that officer's basic skill level, motivation, and competence. However, the rating system emphasizes, and rightly so, the performance of the officer apart from the circumstances of the unit. This is to avoid 'punishing' a company commander, for example, who happens to hold this position while his unit decommissions, and to give him an equal opportunity for promotion when compared to a company commander whose unit happens to be deployed to a military operation. While this principle of parity is important for many different reasons, the tactical knowledge derived by these two hypothetical commanders is likely to be quite different. Thus officer evaluation reports (OERs) are not and should not be viewed as a sufficient source of information about the overall tactical competence of a given officer, at least not in their present form (although they do provide some useful insights).

³⁴ Interview with the author, 29 May 1998.

Unfortunately, the Army maintains scant reliable and centralized information about historical levels of training that have occurred during unit assignments.³⁵ Thus there was little empirical basis from which to evaluate changes in unit activity levels that might have affected officers' opportunities to develop their tactical skills. Although some officers we spoke with claimed that their subordinates were getting ample training opportunities -- even more, in some cases, than what they themselves had been offered -- persistent perceptions of degraded opportunities, attributed not to shorter assignments but to declines in unit training levels, were sufficiently widespread to merit further attention. This chapter presents the results of our investigation into this issue. The data that we collected indicate that:

- home station field training opportunities in warfighting brigades, even for assignments of the same type and length, in fact diminished over the 1990s, though these declines were much more substantial for Armor officers than for Infantry;
- after the Gulf War, assignments involved increasingly more time deployed to operations and overseas exercises (although deployments appear to have fallen off again for Infantry officers in the later 1990s); and
- both Infantry and Armor officers spent much less time in maneuver training, which implies that more recent officers have less knowledge of the challenges associated with unit synchronization than did officers in the past; similar significant falls in lower-echelon events imply that junior officers have had fewer

³⁵ One potential exception is a record of individual officers' participation in Combat Training Center (CTC) rotations. Within the last few years, individual officers' record briefs (ORBs) have been marked with a designator if an assignment included a rotation to a CTC. However, these data have some significant limitations: first, the marker is only applied if the officer was serving in a certain subset of positions; second, its reliability is not known, and was questioned (especially for earlier years) by some of the personnel analysts we spoke with at the Army's Personnel Command. Beyond these drawbacks, CTC rotations are only one component of unit training activities, and thus not a complete indicator of training levels. Rotations are preceded by a series of "ramp-up" training events, but these can vary; further, knowledge of CTC rotation levels does not provide visibility on the training activities of units that did not attend. We therefore did not attempt to analyze this data element as part of our analysis.

opportunities to develop tactical initiative and confidence, skills on which the Army places a high premium.

The remainder of this chapter will expand upon these findings, after first providing a brief description of the data we collected, our main hypotheses, and the basic design of our analytic models. The chapter concludes with a discussion of the implications of our main findings for officers' opportunities to develop tactical expertise.

DESCRIPTION OF THE DATA

In considering how to obtain information on the content (i.e., time spent in training events and deployed) of officers' past and present assignments, we eventually concluded that the only potential source was the officers themselves. There are limitations inherent in this reliance on individual recall, as well as in our use of "time spent" as a proxy for developmental opportunity; both are discussed more fully in Appendix D. Despite these concerns, we did not see a viable alternative. We therefore developed a data collection form³⁶ that asked officers about the amount of time they had spent participating in various field training and simulation events at home station³⁷, as well

³⁶ A copy of the form is included in Appendix C. We designed this form, and our process for gathering data, with the specific intent of trying to minimize some of the potential distortions that might arise from our necessary reliance on individual recall. First, the form asked about discrete and emotionally significant (and thus more likely to be retained in memory) events: for example, we asked about gunnery cycles, CTC rotations, and battalion- and brigade-level field training exercises. Second, the form asked officers first about their most recent assignment, and then earlier assignments. Assuming that recent events are more likely to be remembered accurately, this provided some "grounding" mechanism against which relative comparisons could be made, hopefully improving the reliability of estimates about the past. Third, we reviewed the forms in person with most officers from whom we collected data. This appears to have decreased the incidence of "implausible" or inflated responses, as almost all of the cases in which reported training time exceeded total time in a given assignment were from officers we were not able to interview face-to-face. Nevertheless, it is possible and potentially even probable that memories of past activities were distorted; potential biases resulting from this approach are discussed in greater detail in Appendix D.

³⁷ Home station training as discussed here includes exercises conducted at habitually-associated training areas such as Piñon Canyon for units at Fort Carson and the Yakima Training Area for units at Fort Lewis, even though these units must deploy to these locations. Deployments for training purposes include only those events that fell

as the time they had spent deployed either to operations or other exercises or to the Army's Combat Training Centers (CTCs). We asked for this information not only for current assignments, but for all past assignments in TOE units at brigade level and below.³⁸

We requested information from all battalion and brigade XOs, S3s, and commanders, as well as at least one company commander in each battalion, who were assigned in 1998 or 1999 to one of the 23 TOE Infantry or Armor brigades in the Continental United States (CONUS). Table 4.1 below summarizes our response³⁹ rates, by position type and branch (a more complete description of these data is included in

Table 4.1: Response Rates by Type of Assignment and Branch

Position Type	Population^a (IN/AR)^b	Responded (IN/AR)	Percent Responded (IN/AR)
BDE CDR	23 (13/10)	9 (5/4)	39% (39%/40%)
BDE XO	23 (13/10)	17 (11/6)	74% (85%/60%)
BDE S3	23 (13/10)	15 (10/5)	65% (77%/50%)
BN CDR	69 (43/26)	43 (28/15)	62% (65%/58%)
BN XO	69 (43/26)	40 (26/14)	58% (61%/54%)
BN S3	69 (43/26)	38 (27/11)	55% (63%/42%)
CO CDR	69 (43/26)	41 (30/11)	59% (70%/42%)
TOTAL	345 (211/134)	203 (137/66)	59% (65%/49%)

^aAt the brigade and battalion level, these numbers reflect the number of officers serving in each respective position from whom we requested data. These represent the entire population of CONUS Infantry and Armor units, with the exception of the three battalion-level organizations that make up the Opposing Forces permanently stationed at the Combat Training Centers. At the company level, the total population of company commands in Infantry and Armor units is approximately 275, but to minimize the stress on units we only requested data from one commander in each battalion.

^bThese designations reflect the branch of the unit, not necessarily of the officer.

outside of a unit's typical training schedule, e.g., to overseas and/or joint exercises, or to other exceptional events.

³⁸ This is true with two exceptions, platoon leaders and company XOs. When testing our initial set of data collection forms, respondents made it clear that they did not feel they could accurately recall the amount of time they had spent engaged in various activities this early in their careers, which for most of the officers we sampled had been ten to 15 years prior. The data we collected therefore include time in TOE units when serving as company commanders or in battalion or brigade command, XO, S3, or other staff positions.

³⁹ A response is an officer who completed a data collection form.

Appendix D). In addition to the officers serving in the positions noted below, we collected data from 17 other officers who were either attending the Armor and Infantry Pre-Command Courses, or were serving in other unit staff positions.

Each respondent provided information not only about activities during his current assignment, but about all prior assignments to warfighting brigades as well. Each assignment served as one observation. As Table 4.2 displays, our final data set included observations about 476 different assignments (316 Infantry and 160 Armor) that began between 1990 and 1998, from 220 different officers (146 Infantry and 74 Armor).

Table 4.2: Observations Included in Analysis, by Year and Branch^a

	1990		1991		1992		1993		1994		1995		1996		1997		1998		TOTAL	
	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR
CO CDR	21	7	11	7	8	4	4	2	2	0	0	0	0	0	5	3	19	5	70	28
BN STF	4	5	6	2	2	1	1	0	5	2	7	3	3	0	6	3	1	0	35	16
BN S3	4	0	0	0	1	1	7	4	4	9	8	6	4	3	9	6	26	8	63	37
BN XO	0	1	2	0	1	2	3	0	6	2	3	4	3	3	5	5	22	6	45	23
BDE STF	5	3	1	3	3	0	0	0	3	0	0	0	4	1	12	4	3	1	31	12
BDE S3	0	0	1	0	1	0	1	3	5	2	6	3	4	2	1	1	6	4	25	15
BDE XO	1	0	0	0	0	0	0	2	2	1	0	0	1	2	3	3	9	3	16	11
BN CDR	0	1	1	0	1	2	1	0	2	2	0	0	1	1	8	4	12	6	26	16
BDE CDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	5	2
TOTAL	35	17	22	12	17	10	17	11	29	18	24	16	20	12	51	30	101	34	316	160

^aBranch indicates the branch of the officer, not necessarily the type of unit to which he was assigned (although only assignments to Infantry or Armor units were included), which is how the data were analyzed.

Data Limitations

Despite outstanding cooperation from most units in support of our data collection, the fact remains that the number of warfighting brigades in the Army is small, and even smaller in CONUS. Though we collected data from at least some officers serving in 18 of 23 brigades⁴⁰ (78 percent), the size of our sample population was inherently limited. This diminished our ability to reliably estimate some differences that would have been interesting. For example, ideally we would have liked to evaluate the experiences of company commanders

⁴⁰ Again, this number does not include the two Opposing Force units that are permanently stationed at the National and Joint Readiness Training Centers, the 11th Armored Cavalry Regiment and the 509th Infantry Regiment, respectively. We did not include these units in our sampling frame because their activities were expected differ substantially from those of "normal" TOE units.

over the entire decade. However, because most of the company commanders who served in TOE units in the mid-1990s were not assigned to CONUS units at the time that we collected our data (and were thus outside our sampling frame), as Table 4.2 shows, we have little or no information about the training content of company command assignments during that time. It would also have been interesting to evaluate differences by location; again, however, we lacked a sufficient number of observations, when spread over time, to draw reliable conclusions about variations by theater, region, or specific posts.

As a point of clarification, the data presented here relate to Infantry and Armor officers, who were included in our sampling frame because they were assigned to Infantry and Armor units. The branch of the officer and the unit are not always the same. An Armor officer's assignment in a mechanized infantry unit, for example, is included here as an Armor assignment; the converse would be true for an Infantry officer serving in a Cavalry unit.

ANALYSIS RESULTS

We used these data to test a series of hypotheses about changes in assignment content. Before turning to our results, this section describes the five basic hypotheses we examined and the structure of the models we used to analyze them.

Research Hypotheses

To address our broad research hypothesis that the content of unit assignments had changed over the 1990s, the data we collected were used to empirically test five more detailed hypotheses. The first three concerned time spent in various training events at home station, and the last two addressed deployments.

One of our main interests was whether an assignment in 1998 that was identical to one in 1990 in terms of type of position, branch of the officer, location, and duration involved less total time spent in home station training (both field and simulation).⁴¹ Our first hypothesis

⁴¹ The categories of field training events were gunnery tables, live-fire dismounts, platoon-, company-, or battalion- or brigade-level field training exercises (FTXs), company-level Combined Arms Live-Fire Exercises (CALFEXs), battalion- or brigade-level Fire Control Exercises

was therefore that time spent in home station training had changed over the 1990s. We divided this into two sub-hypotheses: first, that over time assignments involved less field training (Hypothesis 1A), and second, that increasingly more time was allocated to simulation (Hypothesis 1B).

In our unit interviews, more nuanced themes about perceived changes in home station field training emerged. This led us to develop two additional hypotheses (2 and 3). Hypothesis 2 concerned the division of field training time between live-fire and maneuver events. The two components of the second hypothesis we tested were that live-fire training had become less frequent (Hypothesis 2A), while time spent in maneuver training had risen (Hypothesis 2B). Hypothesis 3 addressed time spent in higher- versus lower-echelon training. The perceptions of those we interviewed were mixed as to how (or if) this had shifted. Some officers claimed that their subordinates were not spending enough time in platoon- and company-level events, and instead were training almost exclusively at higher echelons. This was typically attributed to a rising number of higher-profile large unit exercises upon which senior officers placed very high priority, which sometimes overrode the training plans of subordinate commanders. Others claimed that conducting battalion- and brigade-level events had become a practical impossibility, and that junior officers were instead only being exposed to training at the small-unit level. Thus the concern about the appropriate balance between lower- and higher-echelon events was shared, but perceptions about how it had shifted (and whether this positive or negative) varied. Hypothesis 3 thus examined whether there had been shifts in the amount of field training time allocated platoon- and company-level events (Hypothesis 3A), and to battalion- and brigade-level exercises (Hypothesis 3B).

In addition to these hypotheses about home station training, many officers we interviewed stated that the deployment content of assignments had also changed. Although this belief was not universal,

(FCXs), time spent as Opposing Forces or as an Observer/Controller (other than at a CTC), and "other" training at the platoon, company, or battalion or brigade level. Simulation categories included SIMNET, JANUS, ARTBASS, BBS, division- and corps-level Battle Control and Training Program (BCTP) events, and "other".

it was frequently asserted that deployments to operations and/or exercises had increased in the years after Operation Desert Storm/Shield (ODS/S) (i.e., that they had fallen after the war and increased since then). There were also some officers who believed that opportunities to deploy to the Combat Training Centers (CTCs) had concurrently declined. Our fourth and fifth hypotheses, therefore, were that assignments beginning after 1991 involved increasingly more time deployed away from home station (to events other than CTCs) (Hypothesis 4), and less time spent at the CTCs (Hypothesis 5).

To summarize, our five basic hypotheses about changes in the content of unit assignments over the 1990s were as follows:

- (1) Home station training changed
 - A: Less time was spent in field training events
 - B: More time was spent in simulation
- (2) Field training time was spent in different kinds of exercises
 - A: Less time was spent in live-fire events
 - B: More time was spent in maneuver events
- (3) Echelons of field training events shifted
 - A: More/less time was spent in platoon- and company-level events
 - B: More/less time was spent in battalion- and brigade-level events
- (4) More time was spent deployed to operations and exercises
- (5) Less time was spent deployed to the Combat Training Centers

Model Structure

These five hypotheses involved eight separate types of activities that we assume foster the development of tactical expertise. These are listed in Table 4.3, along with abbreviations for each that are used in

Table 4.3: Types of Activities

Activity	Abbreviation
Home station field training	HS Field
Home station simulation training	HS Sim
Live-fire training	Live-fire
Maneuver training	Mnvr
Platoon- and company-level training	PLT/CO
Battalion- and brigade-level training	BN/BDE
Deployments other than to CTCs	Non-CTC Depls
Deployments to CTCs	CTC Depls

subsequent figures. We estimated 16 individual regression models that correspond to these eight activity types for the two officer branches (Infantry and Armor).⁴² For each model, the dependent variable was the number of weeks spent in each of the activities listed in Table 4.3 during a given assignment -- in the figures presented below, however, the "per assignment" estimates have been converted to an annual average to allow for easier interpretation. The independent variables included a time variable, as well as dummy variables representing position types and locations and a continuous variable for the number of weeks spent in the assignment.

We used two basic model designs. The first was a "rates" model testing whether training or deployment levels had changed linearly with time (either positively or negatively) over the course of the 1990s. There were two basic reasons for this formulation: first, the early 1990s were typically held up as a benchmark of "good times" among those we interviewed, with the usual claim that things had "generally gone down hill" since then. Second, because of the many factors that affect training levels, we had no specific rationale for testing alternative patterns of change (e.g., we did not have information suggesting that training funds dropped sharply in a given year or set of years, or that range constraints became much tighter at some point, etc.).

We estimated a second model design in the few cases when the linear specification did not produce significant results. This was a "levels" model, in which training and deployment levels are related to a step function of time. This model has the advantage of greater flexibility than the "rates" model, since the overall pattern of change is unconstrained. It has the disadvantage that the time effect is constrained to be identical within each step. Step patterns were chosen based on a visual inspection of the data. This "levels" model produced significant results in two cases, live-fire training and non-CTC deployment levels for Infantry officers. In the former case, the step pattern was 1990-91, 1992-96, and 1997-98. In the latter, the step pattern was 1992-93, 1994-95, and 1996-98. In cases when the "levels"

⁴² The full specification and results for each of the 16 models are presented at the conclusion of Appendix D.

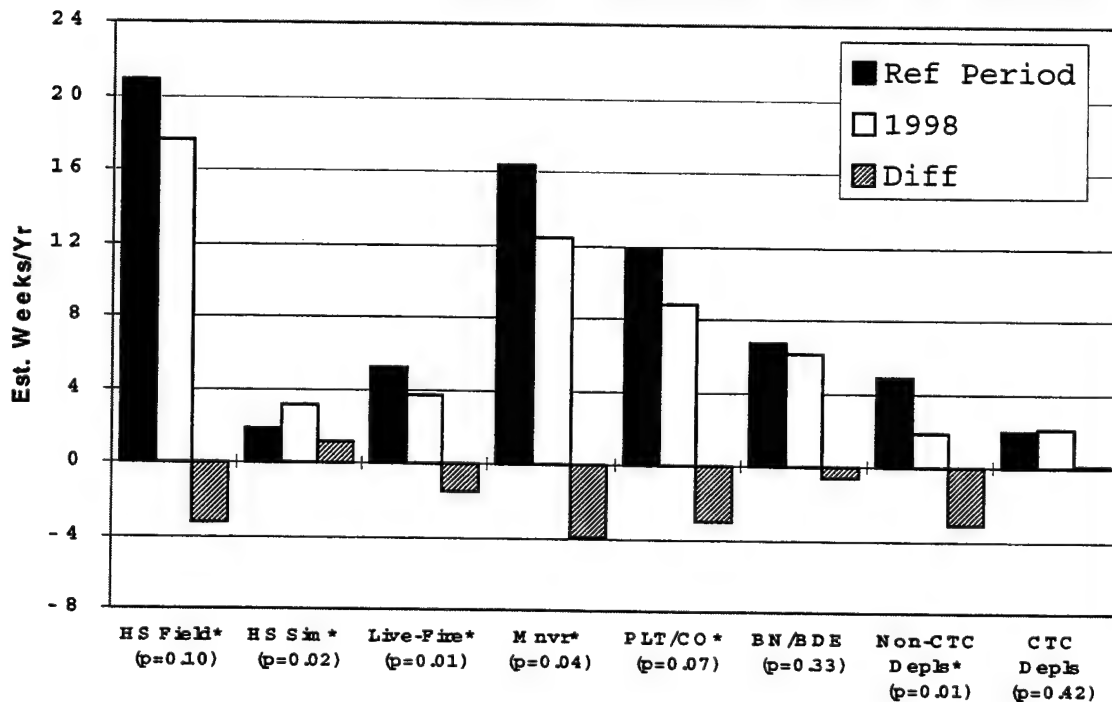
model did not produce significant results, we reverted to the original "rates" model. For these cases, insignificant results are reported.

For each of our 16 models, we defined a "reference period" against which 1998 levels of activity were compared. This reference period depended upon whether the "rates" or "levels" model was used. For the "rates" model, the reference period was 1990 for training events, and 1992 for deployments. For the "levels" model (which again only applies to two of the 16 models, both for Infantry officers), the reference period is 1992-96 in the case of live-fire training and 1994-95 for deployments other than to the CTCs.

Results of Model Estimation

Figures 4.1 and 4.2 summarize the results of estimation of the models just described. Each figure shows the estimated average number of weeks per year an average officer spent participating in the eight kinds of training and deployment activities. The kinds of activities are shown on the x-axis, with three bars for each type. The black bar depicts the average number of weeks per year spent in the relevant activity during the reference period (which is shown at the base of the

Figure 4.1: Estimated Changes In Assignment Content (IN Officers)



bar). The white bar shows the average amount of time spent in that activity in 1998, and the gray bar shows the change from the reference period to 1998. In cases when the differences are statistically significant, the event names are marked with an asterisk. Associated p-values are shown below the event names.⁴³

Figure 4.1 shows that there were statistically significant changes associated with almost all of our hypotheses for Infantry officers, although not all of these changes were large in absolute terms. For example, our results indicate that Infantry officers spent less time in field training events over time, though the total fall between 1990 and 1998 was only 3.3 weeks. And simulation training, though it doubled over the 1990s, still accounted for only a small amount of training time (three weeks in 1998).⁴⁴

Time spent in live-fire training also fell, but more recently - between the mid- and late 1990s, it was estimated to have fallen about 1.5 weeks (a 29 percent decline). On the other hand, maneuver training fell throughout the decade, from over 16 weeks in 1990 to 12.4 weeks in 1998. In terms of echelon, declines in Infantry officers' field training time came almost entirely at lower levels: platoon- and company-level events were estimated to have decreased by 25 percent to a nine week annual average in 1998; there was no significant change in the amount of time spent in higher-echelon events.

Changes in deployments were not entirely consistent with expectations of a continuous rise: non-CTC deployments were highest in the mid-1990s, but fell by almost two-thirds by the late 1990s to an average of less than two weeks per year. The reliability of these results in particular is uncertain, however, because of biases in our sample population. Data in years prior to 1997 related to activities during assignments at Army installations worldwide, because our sample included officers who had subsequently rotated back to CONUS locations. However, deployments during assignments to overseas posts in 1997 and 1998 were not captured in our data set, because officers in those units

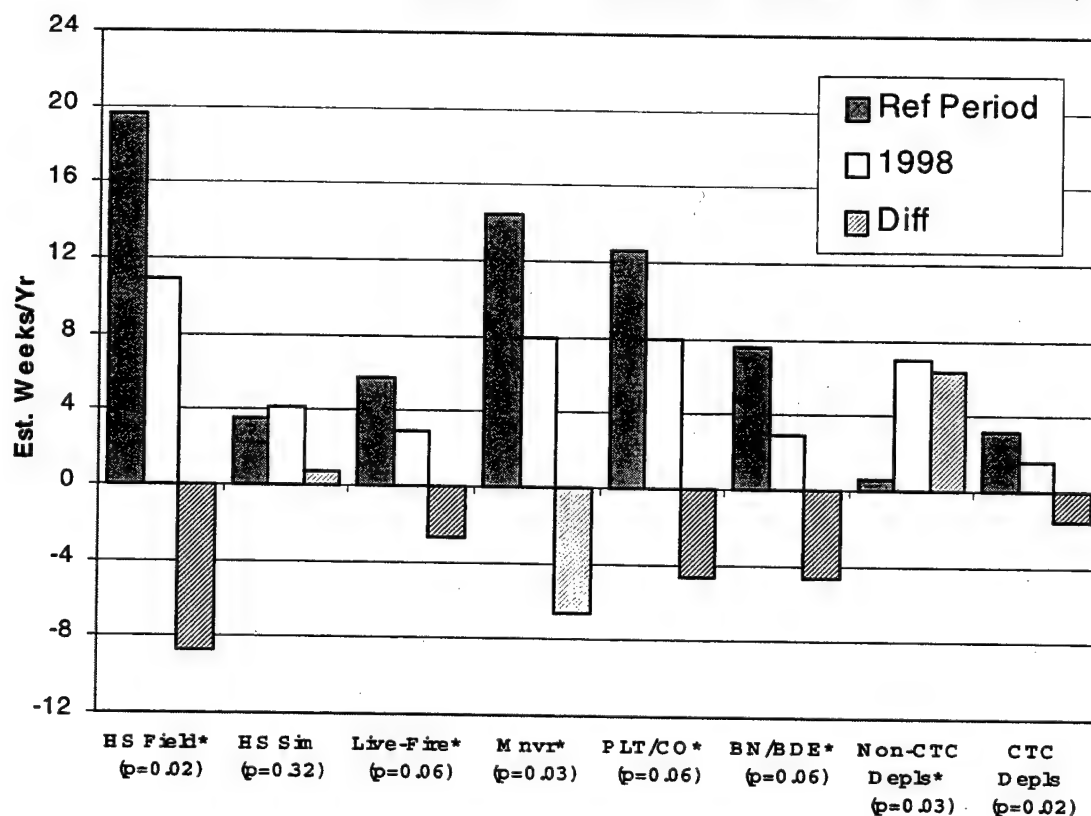
⁴³ The p-value is the level at which the result is significant. That is, p is the probability that the regression results supporting the hypothesis would occur if the hypothesis were in reality false.

⁴⁴ More detailed graphs of these findings, by individual event type, are included in Appendix D.

were not included in our sampling frame. If deployment rates were higher in those units than they were in CONUS over the entire decade, then our deployment estimates for the late 1990s would underestimate average deployment times across the force. Thus our results indicating a fall in the amount of time that Infantry officers spent deployed for reasons other than to CTCs between the mid- and late-1990s are subject to this caveat. Such bias is not expected to have affected the data on deployments to CTCs, which showed no significant change over time; the annual average remained at about two weeks throughout the decade.

The trends for Armor officers conformed more closely to the anecdotes we heard in our interviews, as shown in Figure 4.2 below. Most notably, there was a large decline in field training: in 1998, an average 12-month assignment was estimated to include only 11 weeks in the field, down from almost 20 weeks in 1990. This reduction was reflected in decreases in the amount of time spent in both live-fire and maneuver training events, both of which also fell by about half over the

Figure 4.2: Estimated Changes in Assignment Content (AR Officers)



course of the decade. By 1998, Armor officers were estimated to average just three weeks in live-fire and eight weeks in maneuver training each year.

Lower- and higher-echelon field training events also declined at about the same rate of about four days annually, which led to a total fall of four and a half weeks between 1990 and 1998. This represented a 37 percent decline in platoon- and company-level training, and a 61 percent fall in time spent in battalion- and brigade-level events. The slight increases in simulation training were not statistically significant, and simulation levels remained at an annual average of about four weeks over the course of the decade.

While field training fell, time spent deployed to operations and exercises increased. From a low of under one week per year in 1992, by 1998 the estimated annual average had risen to seven weeks, and increase of almost a week per year. At the same time, time spent at the CTCs fell by half, from an estimated three weeks per year in 1992 to about a week and a half by 1998.

Table 4.4 summarizes our basic hypotheses and findings, for both Infantry and Armor officers.

Table 4.4: Summary of Model Results

Hypothesis	Infantry Officers	Armor Officers
1: Home Station Training Changed	True: field training declined over the 1990s while simulation increased	True: field training declined over the 1990s while simulation remained roughly constant
2: Field training time was spent differently	True: live-fire training declined between the mid- and late 1990s, and maneuver training declined throughout the decade	True: both live-fire and maneuver training fell over the 1990s
3: Echelons of field training time shifted	True: time spent in lower-echelon training declined over the 1990s, participation in BN- and BDE-level events remained roughly constant	True: both PLT- and CO-level and BN- and BDE-level training fell over the 1990s
4: More time spent deployed to operations and exercises	Partly false: time spent in these deployments estimated to be lower in the late 90s than in the mid-90s	True
5: Less time spent deployed to CTCs	False: no significant change in average time spent at CTCs	True

IMPLICATIONS FOR TACTICAL DEVELOPMENT

Interpreting the implications of these changes for the development of tactical expertise is not formulaic, but requires judgment. Among other complications, the significance of declines in field training may be mitigated by the fact that these numbers relate only to training at home station. Some deployments, which are not reflected in the data on home station training, involved and/or were for the express purpose of conducting field training events. For example, some officers deployed to large-scale exercises in Egypt, Southeast Asia and Kuwait. Although the views of officers we interviewed differed on the quality of such training, most of these exercises took place in large maneuver spaces and involved firing some live ammunition. Thus even though the quality of these exercises may not have been as high as it would have been had the event been conducted at home station or a local training area, the events likely conveyed at least some tactical benefit. Indeed, some officers we interviewed argued that their deployments provided tactical opportunities that were superior to what could have been achieved at home station. Many other deployments were to ongoing military

operations, including peace operations, humanitarian assistance, and disaster relief efforts. These may or may not have involved additional tactical training, and will be discussed more fully below.

It is also true, however, that the Army's training system is more likely to be consistently adhered to when the purpose of the exercise is narrowly defined and locally controlled. This is less likely to be the case for events conducted in conjunction with other services or countries. Thus the level of participation in home station events, though imperfect, is a valid indication of the degree to which officers are being exposed to standardized training over time, training that is presumed to be optimized for the tactical development of U.S. Army forces.

More broadly, because "minimum" levels of certain kinds of training have not been established (at least for individual officers), it is impossible to determine whether exposure has become "too low." These judgments must therefore be left to the Army's leadership. Despite these complications, a review of the kinds of tactical skills different training and deployment events might convey provides a sense of how the changes discussed above may have been reflected in shifts in the experience base over time.

Field training

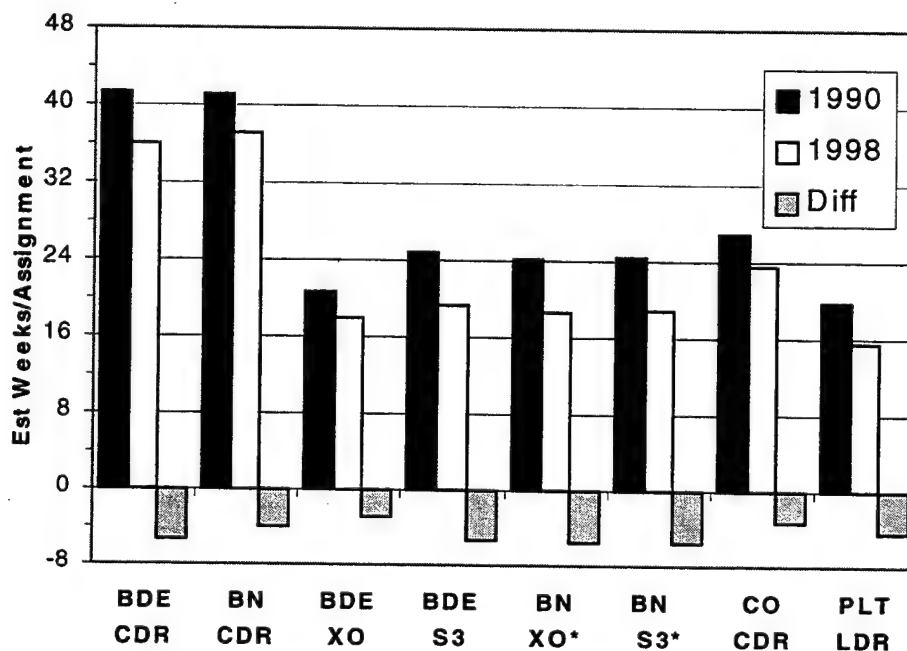
Field training exercises (FTXs) are the cornerstone of unit training, and allow commanders, staffs, and soldiers to operate as they would in various wartime scenarios, practicing how they would work together to accomplish various missions. Officers engaged in these events, either as staff or as unit commanders, learn valuable lessons not only about how to plan for, employ, and support the assets under their direction, but also how to design a fruitful training event. They face and must develop strategies to overcome numerous challenges such as equipment failures, problems with soldiers, inadequate planning, and adverse weather conditions. Exposure to these types of problems, and being engaged in and/or witnessing solutions, builds officers' repertoires of strategies to apply in the future.

Further, one of the cornerstones of constructing expertise is that opportunities to "practice" should be diverse and numerous. Multiple repetitions allow for "discovery learning" (rather than being told the

appropriate response), which has been found to increase an individual's capacity to recognize errors (Anderson, 1987: 204). Numerous iterations also protect against learning inappropriate or inaccurate lessons: people tend to "encode" new information by making cognitive rules about its meaning, oftentimes subconsciously. While these rules are often weak initially, they are likely to self-perpetuate in the absence of contrary information (Lewicki et. al, 1997: 168-9). In terms of developing tactical expertise then, repetition under differing circumstances can decrease the probability of "over-globalizing" or developing cognitive rules that are too broad.

The Army recognizes the importance of these factors in its training program, but the fact that officers spent less time in field training exercises, especially in the late 1990s, suggests that opportunities for repetition became more constrained, and therefore that tactical knowledge became based on a narrower set of experiences than had been the case in the past. To better illustrate this point, Figures 4.3 and 4.4 show the combined effects of the declines in unit field training

**Figure 4.3: Summary of Analysis of Field Training Exposure, 1990/98
(IN Officers)**



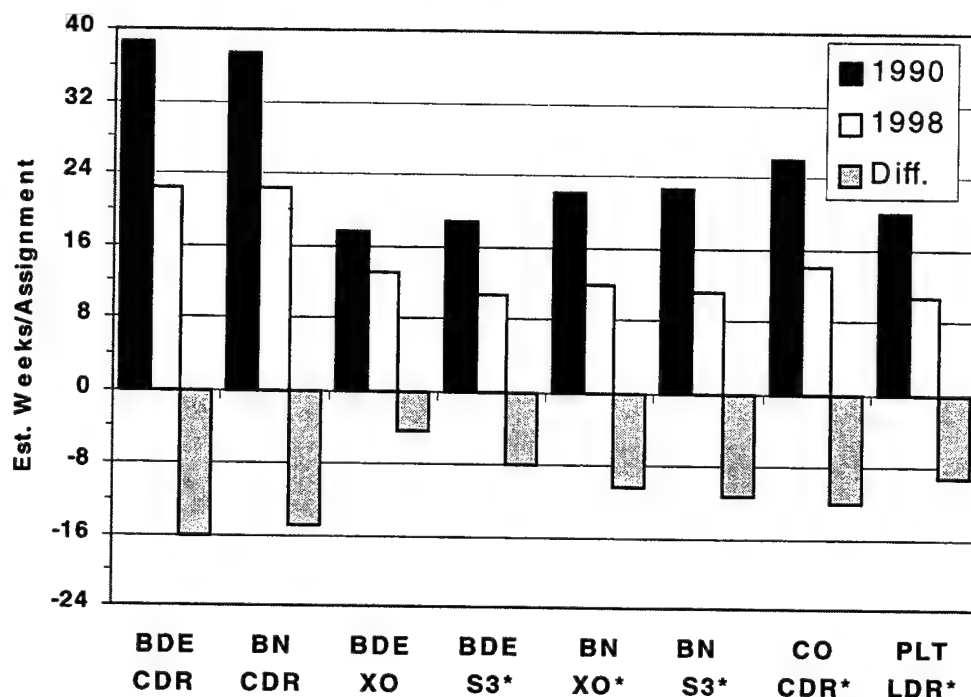
discussed in this chapter with the shifts in the length of key positions presented in Chapter 3. As in earlier figures, there are three bars for each position type: the black bar depicts the total number of weeks that an officer serving in that job for the average length of that position in 1990 would have spent engaged in field training events. The white bar shows a similar estimate for 1998, reflecting both changes in the average length of the assignment and the decreases in field training estimated by our models presented above. The gray bar shows the change over time. As earlier, statistically significant differences are marked with an asterisk.

For every position type, fewer total weeks had been spent in field training in 1998 than in 1990 (as reflected by the negative values of the hatched bar). However, for Infantry officers, these differences were only significant (i.e., not attributable to chance) in the case of battalion XO's and S3's (and for first-time platoon leaders, though this level of detail is not presented until the next chapter). That is, at the end of a battalion XO assignment that began in 1990, an average Infantry officer would have spent about 24 total weeks in field training events at home station. By 1998, the average XO would have spent only 18 weeks in such events.

Figure 4.4 shows that these trends are more serious for Armor officers. Except at the most senior levels, by 1998 all positions involved significantly less field training than they had in 1990. Most Armor Majors, Captains, and Lieutenants had spent at least eight weeks less time engaged in tactical "practice" during key developmental assignments than had earlier officers, a significant reduction in the experience base from which are expected to operate in the future.

Beyond overall training levels, certain types of field training (e.g., live-fire and maneuver, and lower- and higher-echelon events) are intended to convey different lessons. Therefore, the balance among different kinds of training is also important. Live-fire events provide officers the opportunity not only to hone the basic skills of their units in weapons employment, but also (and perhaps more importantly) to be exposed to and to learn to cope with some of the psychological stresses associated with the dangers of live-fire training. Infantry officers in the late 1990s spent about 1.5 weeks less in live-fire

Figure 4.4: Summary of Analysis of Field Training Exposure, 1990/98
(AR Officers)



training than did officers in the mid-90s, though a one year assignment still involved about four weeks of live-fire exercises. Over the 1990s, Armor officers are estimated to have spent about two days less on live-fire training each year, which resulted in a decline of almost 50 percent between 1990 and 1998 (from 5.7 to 3.0 weeks). These declines may mean recent officers would be less able to cope with the "fog and friction"⁴⁵ that is characteristic of war, and that their ability to lead effectively under such circumstances could be lower than was the case for like officers earlier in the decade.

Maneuver training, on the other hand, focuses on the challenges associated with coordinating the use of multiple weapons systems and combat capabilities, while overcoming difficulties posed by terrain and weather. Over the 1990s, Infantry officers saw a steady decline in maneuver training, so that a year-long assignment in 1998 involved about one-quarter less exposure to such events (just over 12 weeks) than did a

⁴⁵ This phrase is frequently used to describe the confusion and disruption that prevails in an intense combat environment, caused by high levels of activity, information shortfalls, equipment shortcomings, etc.

similar assignment in 1990. Maneuver training for Armor officers fell even more sharply, by almost a week each year; over the course of the decade, this resulted in a reduction of almost half. With much less practice in synchronization and coordination, the challenge for recently-trained officers to meet rising expectations of facility in such areas⁴⁶ looms large.

Another aspect of field training relates to its echelon, or the size of the unit that is the primary training audience for a given event. Generally, echelon can be thought of as a proxy for which commanders and staff are responsible for the planning, development, and execution of an exercise. Changes in the level of unit events can therefore provide insight into whether the opportunities for officers at various echelons to derive the intended developmental benefits of training may have shifted over time. For example, during the course of a company situational training exercise (STX), company commanders interact with more experienced officers to design, justify, and provide for the event, and then to participate in and evaluate its success. Mastering the fundamentals of training management, in addition to the tactical lessons learned from the events themselves, is the foundation that company-grade officers are expected to draw and expand upon as they progress through future staff and command positions.

Many officers we interviewed suggested that junior officers had less discretion over their own training than they had in the past, hampering not only their understanding of effective training management but also their opportunities to engage in learning through trial and error. Both Infantry and Armor officers experienced downward trends over the 1990s in time spent training at lower levels. For Infantry officers, platoon- and company-level training fell by an average of two and a half days annually, so that a year-long assignment in 1998 involved only nine weeks of lower-level training, compared to almost twelve weeks in 1990. For Armor officers, time spent in lower-echelon events fell by over four weeks over the 1990s, to an average of eight

⁴⁶ See, for example, MG Frank Hickling, who argues that changes in technology and operational concepts will require future leaders to have "a broader understanding of the relationship of all battlefield systems to winning the fight" (Hickling, 1998: 44)

weeks per year by 1998. Thus most recent company-grade Infantry officers had 25 percent less time to plan and operate on their own, and their Armor counterparts saw these opportunities fall by almost forty percent. This indicates that today's junior officers are probably less facile with training planning, and may have had many fewer opportunities to develop some of the mental attributes the Army has deemed desirable.⁴⁷

This is not to suggest that all training should be conducted at the small-unit level: there are also valuable lessons embedded in battalion- and brigade-level events, not only for the field-grade officers who design and manage them but for more junior officers who also participate. These exercises stress the synchronization of many different types of units and weapons systems, challenging commanders and staffs at higher levels, but also require subordinates to coordinate with other units in tight spaces and to utilize (or fail to take advantage of) capabilities to which they are not always exposed. They can also provide opportunities to observe how similar units might cope with like challenges differently. Time spent in higher-echelon events remained constant for Infantry officers over the 1990s. For Armor officers, higher-echelon training declined at an estimated rate of four days each year. This meant that between 1990 and 1998, time spent in battalion- and brigade-level training at home station fell from 7.6 to just three weeks, a decline of over 60 percent. Again, some of this may have been offset by participation in deployments; however, it seems likely that at both junior and more senior levels, Armor officers had less of an opportunity in their recent key assignments to develop an appreciation for the challenges of combined arms operations than did officers in similar positions earlier in the decade.

Simulation

⁴⁷ The Army's recently-revised leadership manual, FM 22-100, states that Army leaders should possess initiative, judgment, and self-confidence (FM 22-100, 1999: B-1). Opportunities for independent operation and learning through the process of making mistakes, which are assumed to be part of the intent of conducting small-unit training, are likely to foster these attributes; therefore, declines in such opportunities may inhibit development in these areas.

Perspectives on the utility of simulation as a tool to build tactical expertise vary widely.⁴⁸ For those skeptical of simulation use, the concern is rarely that simulations are not helpful in and of themselves. Instead, most reservations about simulation fall into one of two categories: the first is its potential to be used improperly (and thus to convey wrong tactical lessons, so that the net effect is negative); the second is the threat that simulation, because it is generally cheaper and more efficient, can or will eventually replace field training, if not altogether then to an extent beyond which is deemed prudent. Proponents of simulation use counter that simulations, when used appropriately, can enhance the tactical benefit of field training by raising entry level proficiency, make better use of scarce resources, and provide variation in training scenarios and conditions that would be impossible to replicate in field events.

Ultimately, the developmental benefit of time spent in simulation probably depends on whether its limitations were properly understood and accounted for, so that the appropriate lessons were derived. In the absence of more detailed research, it is difficult to judge whether the rising use of simulations by Infantry officers (and the constant trend for Armor officers) enhanced or detracted from tactical development. Because simulation use remains a fairly small proportion of most training time, it is not likely that simulations have had a major effect either way. However, as the Army intends to increase simulation use in the future, the concerns expressed by those skeptical of simulation should be taken into careful consideration.

Deployments

As noted above, it appears that for Armor officers at least, home station training has fallen while deployments to operations and exercises have increased. There has been a vigorous debate about the effects of some of these deployments (especially those to peace operations (POs)) on tactical skill-building. On the one hand, some military analysts and practitioners charge that such operations, because they differ in some significant ways from intense combat situations, detract from the warfighting mindset and displace valuable training

⁴⁸ See, for example, Drillings and Saferty, 1997; Dubik, 1998; Mastaglio, 1997; Morgan, 1989; Mosier, 1997; and Swan, 1998.

opportunities.⁴⁹ On the other, some counter that POs in fact incorporate many warfighting skills⁵⁰ (although some may be performed to different standards (Taw et. al., 1998)), and offer unique opportunities for young officers in particular to exercise leadership, judgment, and responsibility in situations that may become increasingly common in the future.

Some of this difference in opinion stems from the variety of experiences that officers can be exposed to during a given operation. The nature of POs can vary substantially, from those that closely approximate combat (e.g., Somalia) to those that are generally more benign (e.g., Multinational Force and Observers in the Sinai). The tactical content of an operation can also depend on the stage at which an officer participated: in recent operations, the initial entry phases have tended to be more combat-like, while later phases have been less intense. Tactical benefit is also affected by the degree to which a specific operational mission (apart from that of the overall operation itself) relates to wartime functions, a particular concern for Infantry units that have been used in a Military Police or guard-type role in operations such those in Haiti and Southwest Asia (Taw et. al., 1998).

Despite all of these variables, which differ for each deployment, most deployments involve at least two features that are important in the construction of tactical skills. These are the opportunity to experience first-hand the challenges associated with both the deployment process, or the effort and problems associated with moving a unit across long distances, and with sustainment, or ensuring the continued supply and protection of a unit for periods of time that exceed those typical

⁴⁹ See, for example, Rosenberger, who testified to Congress in 1999 that peacekeeping operations "quickly erode warfighting knowledge, skill, and ability, [and are] creating a growing generation of young leaders who don't know how to fight as members of a combined arms team." (Rosenberger, 1999: 2).

⁵⁰ For example, a Captain who commanded a company in Bosnia testified that "[m]any individual and collective tasks associated with peacekeeping operations apply universally to combat operations.... As well, units continue to train "normal" tasks while deployed.... In addition, the military decision making process (MDMP) is nearly identical to habitual combat missions, leaving company leaders and battalion and higher-level staffs proficient in the orders production process." (Isenhower, 1999).

of home station training events. Overall, even opponents of participation in peace operations would likely concede that there is at least some useful tactical knowledge gained during the act of deploying, and in being deployed for long periods of time, irrespective of the mission. The real question is therefore whether the opportunity cost in terms of home station training that may have been foregone while preparing for, executing, and recovering from a deployment exceeds the potential tactical benefit derived from participating in an operation. Because there is no opportunity for a controlled experiment, the answer to this question will always be subjective. The Army's leadership must thus decide whether trends in opportunities to develop tactical skills during deployments, and the frequently-associated displacement of dedicated home station training, are cause for concern. This may be less of an issue for Infantry officers, if our analysis accurately represents decreasing amounts of time spent in such deployments in recent years. Armor officers, on the other hand, went from very little time deployed in the post-ODS/S timeframe (less than one week, on average, in 1992) to about seven weeks annually in 1998, a substantial rise.

The tactical utility of deployments to CTCs is more straightforward. The unique training opportunities at the CTCs teach officers such things as where to position units on the battlefield, utilization and refinement of the orders process under high-stress conditions, the effects of extended operations, fire discipline and distribution, and synchronization of fires (TRADOC PAM 525-100-2, 1993). Exposure to many of these challenges is not available in any other venue (or at least not to the same degree), so that for many officers CTC rotations represent the only opportunity short of war itself to practice some of the crucial aspects of combined arms operations.

CTCs also provide commanders with the opportunity to perform self-evaluations of their unit's training programs (Dubik, 1998) and their staff's performance (Halpin, 1995). One study found that "no matter how rigorous," "home station training... apparently cannot replicate the conditions [at the NTC] that consistently clarify staff deficiencies" (Halpin, 1995: 32). Thus in the absence of CTC experience, commanders may have a less realistic appreciation of their own abilities to prepare

their units for combat, or of the proficiency of their staffs. Such knowledge can shape how these officers would train in the future, and provide lessons that could be passed along to subordinates who will eventually design their own training programs.

Features such as a dedicated Opposing Force (OPFOR), a trained group of observer/controllers (O/Cs), and numerous after-action reviews contribute to making the CTC experience an important (and many would argue imperative) component in the development of tactical expertise. This opportunity remained fairly constant during the 1990s for Infantry officers; the average assignment for an Armor officer in 1998, on the other hand, involved just 1.6 weeks at a CTC, compared to over three weeks in 1992. This signifies large declines in the opportunity to develop maneuver and synchronization skills while under great stress.

In conclusion, the changes discussed in this chapter do not necessarily signify a problem, merely a departure from earlier levels of training opportunity (and therefore, it is presumed, of resulting expertise). The declines, however, when taken in conjunction with some of the shorter assignments described in Chapter 3, signify an even greater gap than an evaluation of either aspect of assignments (i.e., their length or their content) would suggest separately. But in order to fully appreciate the impact of these changes, they must also be viewed in light not only of an officer's most recent assignment, which is just one portion of his cumulative knowledge base, but of his entire career to date. This issue is the subject of Chapter 5.

(5) LEVELS OF EXPERTISE AT ENTRY INTO KEY ASSIGNMENTS

Our third research hypothesis addressed the claim that various changes in career patterns had caused officers to arrive in key positions with less experience than had previously been the case. Some commanders we spoke with stated that current Lieutenants, Captains and Majors in particular had spent less time in warfighting units overall, and less time in command or leadership positions, than had similar officers earlier in the decade. Two basic themes emerged about the effects of this purported decrease in experience. The first was that these officers were less able to meet unit needs effectively and efficiently. The second was that, because these officers were serving in positions that had an impact on the activities and environment in which more junior officers were being trained and developed, the "second generation" was growing up in a less tactically sound environment. As noted earlier, developmental theory suggests yet a third effect, that the marginal benefit of a tactically rich assignment is likely to be much smaller for someone whose tactical foundation is already shaky than it would be for an officer who had been better prepared.

This chapter begins with a brief review of the personnel data we used to analyze officer careers, and then turns to a summary of the primary findings, by position type. It concludes by tying together the basic findings from all three of our research hypotheses, offering a broad view of how changes in both assignment length, their training content, and career patterns are likely to have jointly affected officers' opportunities to develop tactical expertise.

DESCRIPTION OF THE DATA

Our investigation of changes in career patterns relied on the data contained in the Officer Master File, the same information used to analyze assignment lengths in Chapter 3. This effort, however, focused on the sum total of an officer's assignments up to his exit from a key position in either 1990 or 1998. The unit of analysis, then, was each individual officer (as opposed to separate assignments, as in Chapter 3): each officer's career history was one observation.

Due to aforementioned difficulties with data quality, we were unable to obtain reliable information for more than two groups of officers. We therefore used the same data set pertaining to officers who left key assignments in 1990 and 1998) to analyze career patterns that we had used to evaluate lengths of key assignments. We assessed whether there had been changes between 1990 and 1998 in prior tactical exposure from three different perspectives:

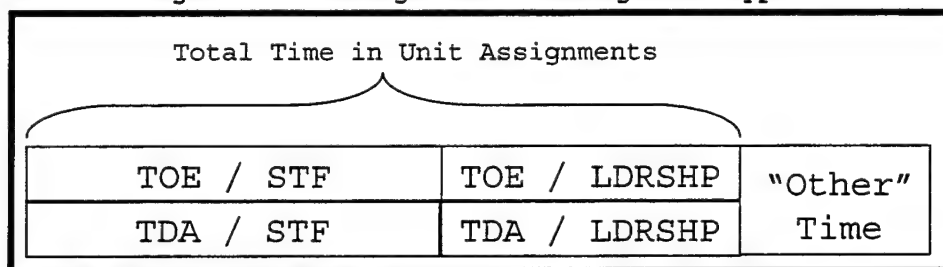
- (1) First, we evaluated the total amount of time that officers had spent in all of their unit assignments to date. This did not include schools or other breaks in service, depicted as "other" time in Figure 5.1 below.⁵¹ (This variable appears as "TOT Time" in the figures that follow.)
- (2) Of this total unit assignment time, we then compared the average amounts of time spent in TOE and in TDA units. This distinction was intended to reflect a basic difference in the opportunities each type of assignment presented for exposure to tactical events (assignments to TOE units were assumed to involve more of such opportunities than those to TDA units). Figures below show values for these categories as "TOE" and "TDA."
- (3) Third, we divided total assignment time into a different set of categories, comparing time spent in "leadership" positions to time spent in staff positions. Leadership jobs included platoon leader assignments, and company, battalion, and brigade command; staff assignments were all other positions. Most leadership positions were in TOE units, although some were in TDA units; staff assignments were in both TOE and TDA units. The leadership/staff distinction was based on presumed difference in roles, predicated on the assumption that in general, commanding a unit during a tactical exercise is likely to contribute more directly to the construction of tactical leadership skills because of

⁵¹ We did not include "other" time because this information is included inconsistently in the personnel records, and we therefore determined that we could not reliably assess time spent in other than unit assignments. This is discussed more fully in Appendix A.

the scope of responsibility involved than does participation while in a staff position, which tends to be more narrowly focused. These distinctions are abbreviated to "LDRSHP" and "STF" in subsequent figures.

Figure 5.1 illustrates these relationships. Essentially, each unit assignment can be put into one of four categories: in a TOE or TDA unit, and in a leadership or staff position. For each group, aggregate averages over the course of officers' careers were compared.

Figure 5.1: Categories of Assignment Types



ANALYSIS RESULTS

The figures presented below indicate the average amounts of time spent in these three categories of assignments in 1990 and 1998, for each position type. Tables E.1 and E.2 in Appendix E show the actual numbers that underlie these figures; the Appendix also includes figures depicting the same information for first-time and repeat position holders. The discussion in this chapter focuses on statistically significant differences; any changes not mentioned were small enough to have been potentially attributable to random variation. Overall, there were more changes in the prior experiences of Infantry officers than there were for Armor, although in general the careers of like officers in 1990 and 1998 were more similar than anecdote had led us to expect.

Infantry Officers

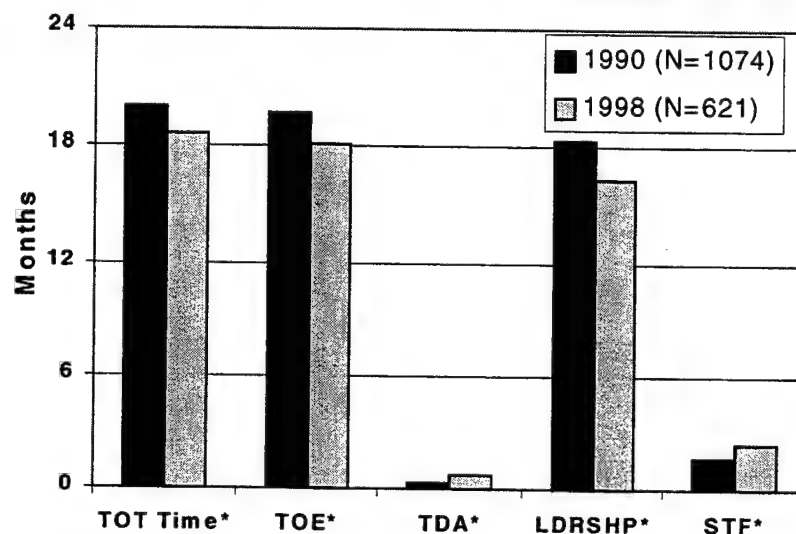
In brief, more senior Infantry officers in 1998 had spent more of their careers in TOE unit assignments and less in TDA positions; Lieutenants' time in TOE units and as platoon leaders fell, while their time on staffs and in TDA assignments increased.

Platoon Leaders

Figure 5.1 shows that overall, Infantry Lieutenants leaving a platoon leader assignment in 1998 had spent less overall time in unit

assignments than had like officers in 1990. Of this time, more had been spent in TDA units, and less in leadership (i.e., platoon leader) assignments.⁵² These overall shifts were evident for both first-time and repeat platoon leaders, suggesting that the shifts away from platoon leader to more staff and TDA time occurred sometime between 1990 and 1996 (when the average repeat platoon leader would have entered his first platoon leader assignment), rather than more recently.

Figure 5.2: Career Histories, Platoon Leaders (IN Officers)



The increases in time spent on staffs are not necessarily negative in and of themselves from a tactical development perspective; unit staff jobs can expose young officers to many useful perspectives, including such things as how subordinate parts of the unit fit into a larger whole and how resourcing processes work. This information can enrich the platoon leader experience, and potentially increase the effectiveness of young Lieutenants as they serve in their first leadership role. It is of greater concern, however, when staff time appears to be coming at the expense of time spent as platoon leaders, especially for those serving in their first platoons, the length of which appear to have become continually shorter over time. (In 1990, the length of repeat platoon

⁵² The percentage of first-time platoon leaders who had held staff positions prior to taking their platoon leader jobs doubled from nine percent in 1990 to 18 percent in 1998; for repeat platoon leaders, it rose from 29 to 36 percent (both were statistically significant). The figures for leadership calculations, by position type, are included in Tables E.3 and E.4 in Appendix E.

leaders' first platoon leader assignments (which had likely been a few years earlier, in 1987 or 1988) had been 13.5 months; by 1990, first-time platoon leader jobs averaged 13.0 months. Repeat platoon leaders in 1998, who would have probably held their first platoon leader assignments in about 1996, spent 12.4 months in those jobs, compared to an average of just 11.4 months by 1998.)

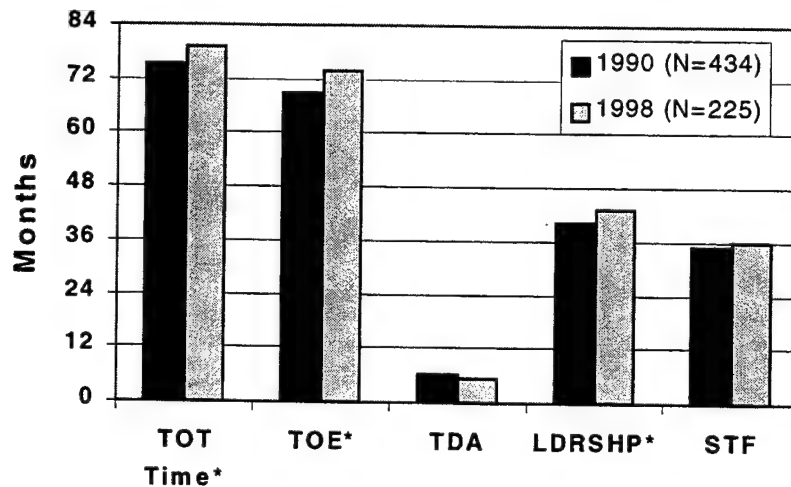
As was noted in Chapter 3, these decreases, when considered in conjunction with the decline in opportunity for second platoon positions (which fell from 51 percent in 1990 to 46 percent in 1990), suggest that a larger proportion of recent Lieutenants will progress to future assignments having spent less time in the leadership positions that provide opportunities to practice tactical skills than did similar officers in 1990 (although they may have a greater understanding of broader organizational issues). Further, as was discussed in Chapter 4, the time that they *did* get as platoon leaders involved even less field training than did like assignments earlier in the decade. Thus opportunities for first-time platoon leaders to actually engage in tactical field training were in all likelihood much lower in 1998 than they had been earlier, and by extension their tactical foundation is probably weaker, collectively, than had been the case for similar officers in 1990.

Company Commanders

Despite the concerns about lesser experience expressed by some of the officers we interviewed, company commanders in 1998 had spent more time in TOE units than had earlier commanders, and had an average of 3.2 additional months serving in leadership (platoon leader and company command) positions.⁵³ They had spent about the same amount of time in TDA and staff positions as had earlier outgoing commanders. Overall, then, it appears that from the perspective of time in assignments, young Infantry Captains in 1998 were likely to have had slightly more exposure

⁵³ This rise in leadership time was due to increases when they had been platoon leaders: both first-time and repeat company commanders in 1998 had spent more time as platoon leaders than had like officers in 1990. Total time as company commanders actually fell for repeat commanders in 1998, because their first command tours had averaged about 10 weeks shorter than they had for repeat commanders in 1990.

Figure 5.3: Career Histories, Company Commanders (IN Officers)



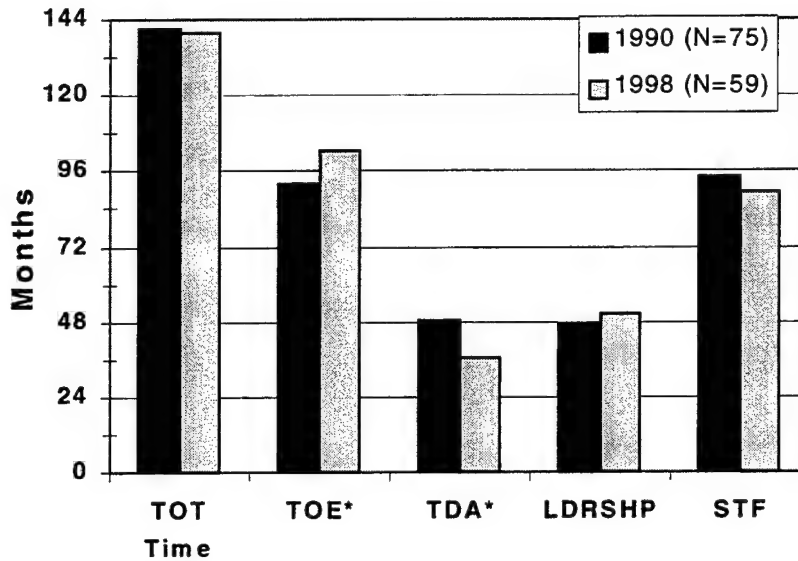
to tactical training events than they had in 1990. This advantage is somewhat mitigated by the apparent declines in unit training discussed in Chapter 4, although these decreases were small enough that the net change in exposure was probably zero, or even slightly positive. It is probably the case, therefore, that the experience base of recent Infantry company commanders is on average about equal to that of company commanders in 1990.

*Battalion S3s and XO*s

Because of reported increases over the 1990s in requirements for post-company command officers to serve in TDA positions (e.g., as Reserve Component advisors and in Recruiting Command), it was expected that the career patterns for Majors who left a battalion XO or S3 assignment in 1998 would differ substantially from those of similar officers in 1990 (because these officers would have been more likely to have spent more time in TDA assignments after they left company command). However, our data did not support these expectations.

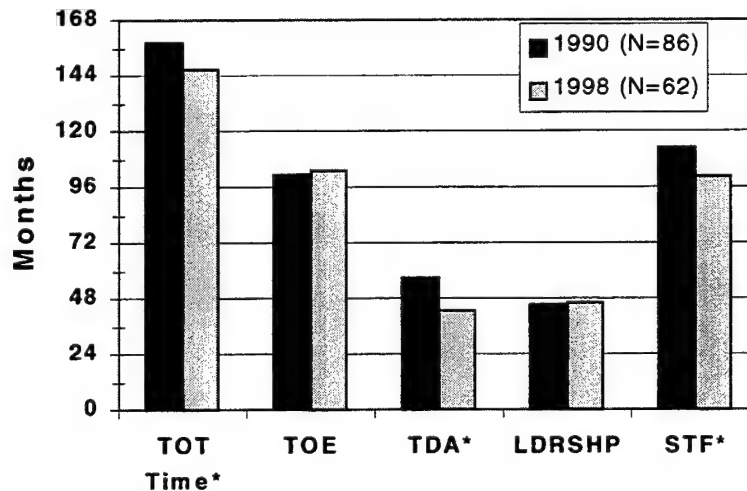
As Figures 5.4 and 5.5 show, instead both S3s and XOs in 1998 saw a significant reduction (of one year for S3s and almost 14 months for XOs) in the amount of time they had spent in TDA units, when compared to S3s and XOs in 1990. S3s served instead in TOE units (spending an additional ten months, a ten percent increase, in such assignments), while battalion XOs merely arrived in their XO positions with less total

Figure 5.4: Career Histories, Battalion S3s (IN Officers)



time in unit assignments overall.⁵⁴

Figure 5.5: Career Histories, Battalion XO's (IN Officers)



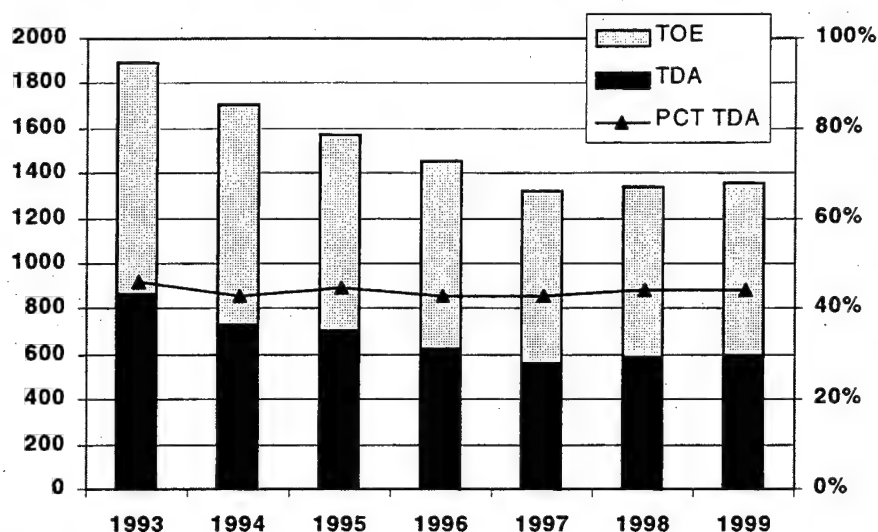
⁵⁴ There was some suggestion that battalion XO's might have gotten "younger" (i.e., that they held like positions, in this case battalion XO jobs, earlier in their careers) because the proportion of "below-the-zone" (BZ) officers, or those who were promoted earlier than typical Army guidelines would suggest, had risen. This does not appear to be the case. According to data provided by the Army's Personnel Command, the percentage of BZ Infantry Majors in September 1993 (the earliest date for which data was available) was 9.8 percent; in September 1998, it was 9.9 percent.

There are a number of possible explanations for why we may not have observed increases in the amount of time these officers had spent in TDA units. One is that the major effects of the purported increases in TDA demand may not have occurred until after the group of officers who entered an S3 or XO position in 1996 or 1997 (and thus who exited in 1998) would have been eligible to serve in those types of assignments. It is also possible that the TDA burden, after accounting for other changes in force structure, manning, etc., has either not shifted that substantially, or that any increases were principally borne by those officers who did not later go on to get an XO or S3 assignment in an Armor or Infantry unit. Our data did not allow us to examine whether the anticipated rises in time spent in TDA positions might be apparent in later cohorts of officers, nor could we assess whether officers who served in TDA positions were more likely to leave the Army or to divert from a career path that might take them back to an S3 or XO position in a warfighting brigade. However, we were able to obtain some information on the percentage of Captains over time who were assigned to TDA units at given points in time, which is shown in Figure 5.6 below.⁵⁵

Contrary to widespread belief in the Army, it does not appear that the relative burden of TDA assignments has increased, at least since 1993 (the earliest year for which data was available). The most plausible explanation for this misconception may be that perceptions of greater demand for branch-qualified (BQ) Captains are based on a shift in how those positions are allocated, rather than on a rise in the overall level. The number of authorized positions for BQ Captains far exceeds the supply, and has for a number of years. Because not all positions can be filled, the Army's Personnel Command must generate a prioritized plan to distribute the available post-command Captains across those authorized positions. Some of the more recent TDA requirements, such as support to Reserve Components, are Congres-

⁵⁵ These data reflect the total number of Captains, on September 30 of each year, who on that date were assigned to either a TOE or TDA unit. The data were drawn from the Officer Master File, and are believed to be imperfect, but presumably in ways that are constant over time (i.e., errors in unit coding, grade, etc. are assumed to occur in roughly equal proportions in each year). Thus while the data may be imprecise in their estimates of total numbers, proportional comparisons should be valid.

Figure 5.6: Percentage of Captains in TDA Assignments (IN Officers)^a



^a Data provided by Army Personnel Command (PERSCOM)

sionally-mandated, and must be manned at 100 percent of the authorizations. Thus it may be that while the overall percentage of TDA assignments has remained constant over the 1990s, an increasing proportion of those assignments have been allocated to Recruiting Command or the Reserve Components, for example, while fewer have been to TDA units that traditionally received a higher percentage (e.g., Active Army support command staffs). Unfortunately, the data do not allow us to reliably identify the types of TDA units to which officers were assigned; the possibility of a shift in proportions among types of TDA assignments rather than an increase in the total level, however, does account for (what would be accurate) perceptions of rising demands in some areas. Nevertheless, the fact remains that the average Infantry officer who left a battalion XO or S3 position in a TOE Armor or Infantry unit in 1998 had not spent significantly more time in TDA assignments than had like officers in 1990, but rather had spent less.

Developmentally, the rise in total TOE unit time for S3s meant that more recent officers were likely to have had more opportunities to engage in tactical exercises in their prior assignments than had earlier S3s;⁵⁶ the average increase of more than one year of such time should

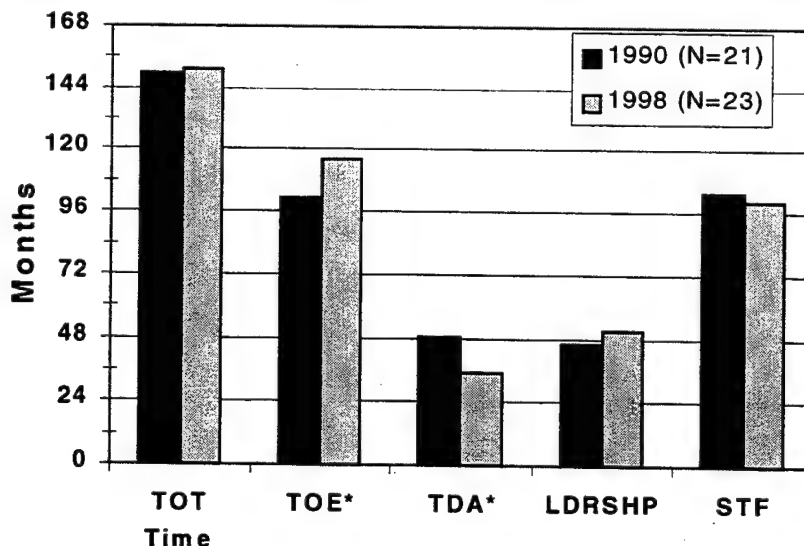
⁵⁶ Although, as was noted in Figure 4.1 in Chapter 4, their experiences while serving as battalion S3s were less tactically intense.

have more than compensated for the declines in field training that occurred over the 1990s. For XOs, time spent in TOE and in leadership positions remained essentially constant over time; however, because the tactical content of at least some of those earlier assignments is believed to have declined (in addition to that of their time spent as XOs), it is probable that their tactical foundation is slightly weaker than would have been the case for similar officers in 1990.

Brigade S3s and XOs

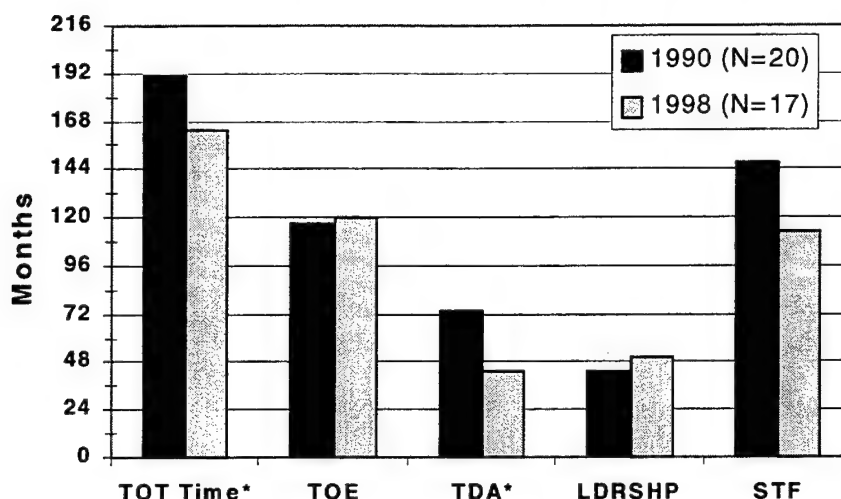
The patterns at battalion level were repeated at brigade: the year's less time that more recent brigade S3s did not spend in TDA units was instead served in TOE units; brigade XOs served less time in TDA assignments than had earlier XOs, but also less total time in unit assignments overall.⁵⁷

Figure 5.7: Career Histories, Brigade S3s (IN Officers)



⁵⁷ These decreases were fairly large: outgoing XOs in 1998 had spent 30 months less time in TDA positions than had outgoing XOs in 1990, a 38 percent decline. Again, this does not appear to be due to a rise in the percentage of BQ officers; in fact, the reverse is true. In September 1998, 12.5 percent of Infantry Lieutenant Colonels were BZ, compared to just 8.7 percent in September 1993.

Figure 5.8: Career Histories, Brigade XOs (IN Officers)



The developmental implications are similar to those for battalion S3s and XOs: declines in field training were probably more than offset by increases in TOE time for brigade S3s, who could therefore be expected to have a broader tactical base than did like officers in 1990, but for brigade XOs, the same amount of time in TOE positions is likely to have involved slightly less exposure to training events over time. However, assuming that most of their time as Lieutenants and Captains was spent in a more rich tactical environment (this would likely have been in the early to mid-1980s), then subsequent declines would be assumed to have less impact.⁵⁸

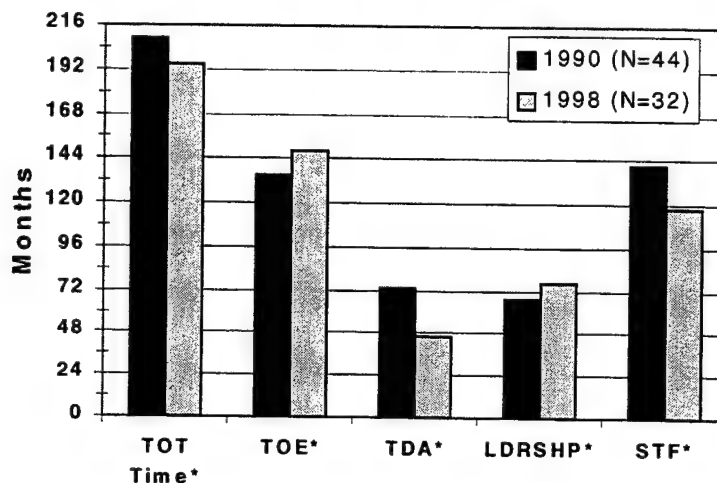
Battalion and Brigade Commanders

As shown in Figure 5.9, overall, battalion commanders in 1998 had spent about 14 months less time in unit assignments than had commanders in 1990. However, later commanders had spent over 12 months more time in TOE unit assignments, and nine months more, on average, in leadership (platoon leader, company, and battalion command) positions. They had spent about 26 months less time in TDA staff assignments, averaging

⁵⁸ We do not have information on the training levels in the mid-1980s. However, officers we interviewed at this level were fairly consistent in their characterization of their training exposure when they had been junior officers as intense and demanding. If these recollections are accurate, this suggests that a strong tactical foundation would have been laid for these officers, which would prepare them to maximize the tactical benefit from more meager opportunities later in their careers.

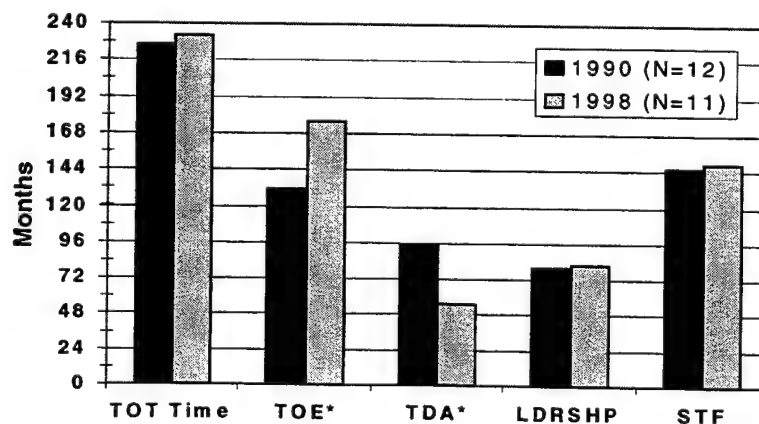
about four years in TDA positions as opposed to over six for departing commanders in 1990. The increases in TOE and leadership time suggest greater opportunities for exposure to tactical events, which, though partially offset by declines in unit training, should still have resulted in more tactical "practice" over their careers as a whole for recent battalion commanders than was the case for outgoing commanders in 1990.

Figure 5.9: Career Histories, Battalion Commanders (IN Officers)



The only significant difference between brigade commanders in 1998 and those in 1990 was a shift of about 40 months spent in TOE rather than in TDA assignments. The presumed large resulting increase in exposure to unit training is likely to have resulted in many more opportunities to practice tactical skills, despite small declines over time in unit training levels.

Figure 5.10: Career Histories, Brigade Commanders (IN Officers)



Armor Officers

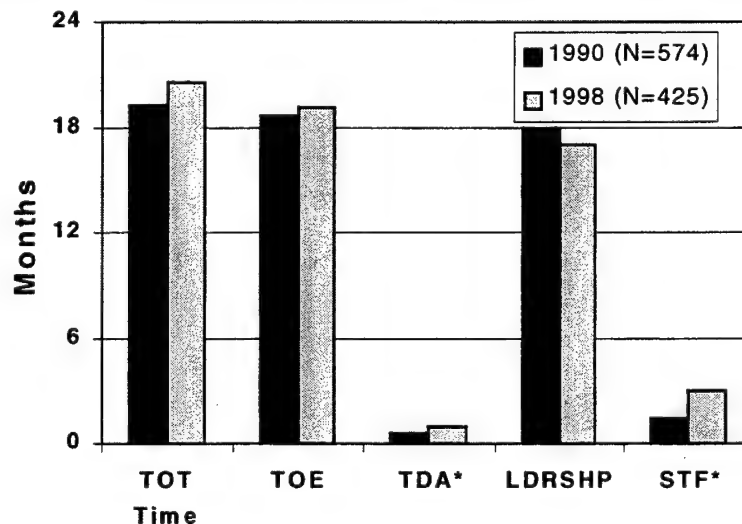
The most notable changes for Armor officers were a decline in tactically-useful time for outgoing platoon leaders in 1998 relative to those in 1990, but an increase for exiting company commanders. There were few changes at the Major level; later battalion commanders, like their Infantry counterparts, had spent a higher proportion of their assignments in TOE rather than TDA units.

Platoon Leaders

Platoon leaders as a whole (both those in their first assignments and those with prior platoon leader experience) had spent more time on staffs and in TDA assignments in 1998 than they had in 1990. These changes were relatively small in actual terms (for staff time, an increase from an average of 1.4 to three months, and for TDA time an increase of about a week, on average, to just 0.9 months), but were much larger, given their short careers, in percentage terms (over 114 percent for staff, and 50 percent for TDA).

As was the case in Chapter 3, the overall average masks some differences between those leaving their first platoons and those with prior platoon leader experience. First-time platoon leaders in 1998 had

Figure 5.11: Career Histories, Platoon Leaders (AR Officers)



spent less time in their platoons, and more in staff positions.⁵⁹ Repeat platoon leaders had also spent significantly more time (two months, on average) in staff positions in 1998 than they had earlier, but this was in addition to their time as platoon leaders, which did not change.⁶⁰

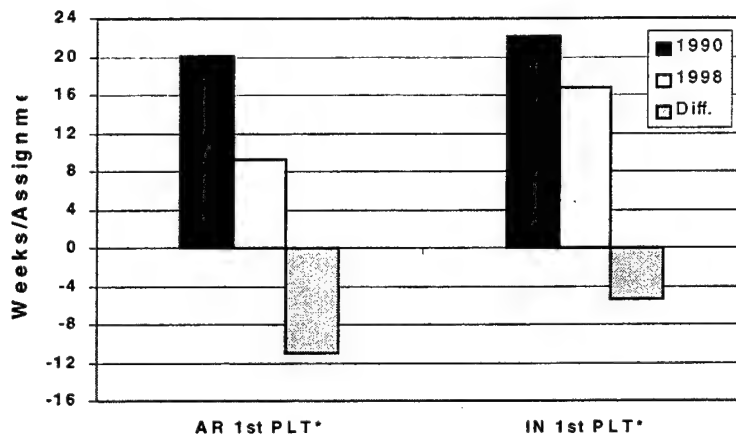
These trends indicate that first-time platoon leaders in 1990 were more likely to have gone directly into a platoon leader assignment than were the Lieutenants who left those jobs in 1998, a larger proportion of whom arrived in their units and spent some time on staff before moving into a platoon leader position. Indeed, only nine percent of outgoing platoon leaders in 1990 had held a staff assignment prior to their first platoon leader assignment; by 1998, 42 percent of first-time platoon leaders had served previously on a staff.

As with Infantry officers, the fact that these increases appear to have come at the expense of longer platoon leader assignments suggests that more recent Lieutenants are likely to have had fewer opportunities to build their tactical knowledge while serving in a leadership role. When coupled with the large declines in unit training levels for Armor officers over the 1990s, decreases in tactical exposure for these young officers are likely to be even more pronounced. Thus it is probable that the tactical foundation of the most recent Armor Lieutenants is in general much less robust than was the case for platoon leaders earlier in the decade. Figure 5.12 shows the combined effects of shorter assignments and lower field training rates on exposure levels for first-time platoon leaders (both Infantry and Armor) in 1990 and 1998.

⁵⁹Platoon leader time dropped by an average of 1.5 months (11 percent) to just over one year; staff time increased from 0.8 months to 2.5 months, a 213 percent rise.

⁶⁰ Staff time rose 85 percent, from an average of two to almost four months; total time in unit assignments increased by about the same amount, rising seven percent to an average of 27 months.

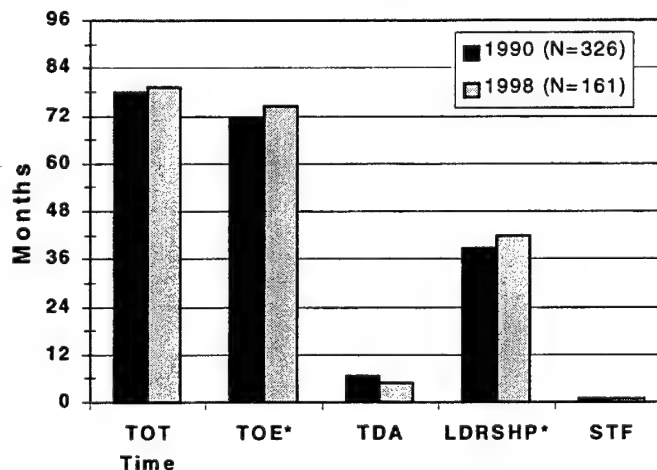
Figure 5.12: Differences in Total Field Training, First-Time Platoon Leaders (IN and AR Officers), 1990-98



Company Commanders

Armor officers leaving a company command in 1998 had spent an average of three months more time in TOE unit assignments overall than had like officers in 1990,⁶¹ due principally to the fact that they had spent more time in leadership assignments, and as platoon leaders in particular. (There was no significant change in the amount of time outgoing commanders had spent on staffs.) Aside from these increases, the backgrounds of company commanders in both 1990 and 1998 were very similar, as shown in Figure 5.13.

Figure 5.13: Career Histories, Company Commanders (AR Officers)



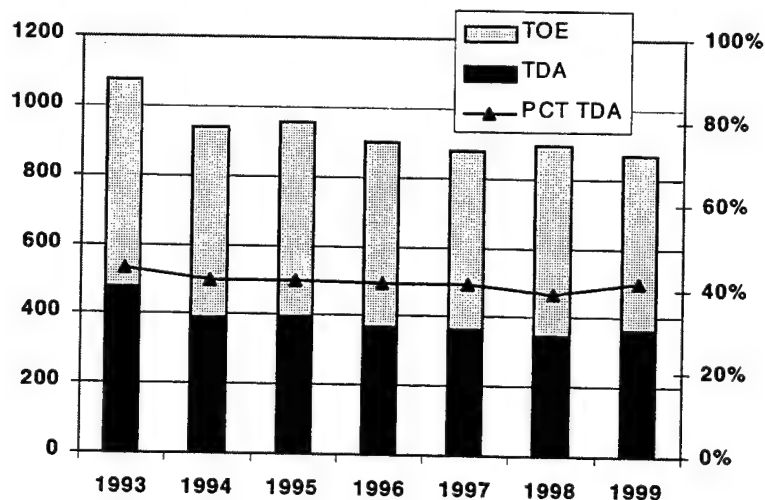
⁶¹ The average in 1990 was 71.4 months in TOE units, or almost six years; in 1998, this was 74.3 months, or about six years and two months, an increase of four percent.

While the additional three months as platoon leaders is positive, it was probably not large enough to have offset the large declines in unit training, especially when lost opportunities in recent company commands are taken into account. Thus more recent company commanders are still likely to have had less exposure to tactical training events, and therefore a less robust tactical base, than did departing company commanders in the early 1990s.

Battalion XO's and S3's

As was the case with Infantry officers, we expected to see an increase in the amount of TDA time, in particular, that outgoing battalion S3's and XO's in 1998 had spent, relative to their 1990 counterparts. Again, however, there was no evidence of significant changes in career patterns for either position.⁶² Figure 5.14 shows that the percentage of Armor Captains serving in TDA assignments has remained stable over much of the decade, which is consistent with our finding that total time in TDA assignments for S3's and XO's did not change between 1990 and 1998.

Figure 5.14: Percent of Captains in TDA Assignments (AR Officers)*



* Data provided by Army Personnel Command (PERSCOM)

In fact there were no significant changes at all in the career patterns of these officers between 1990 and 1998. Nor do we expect the

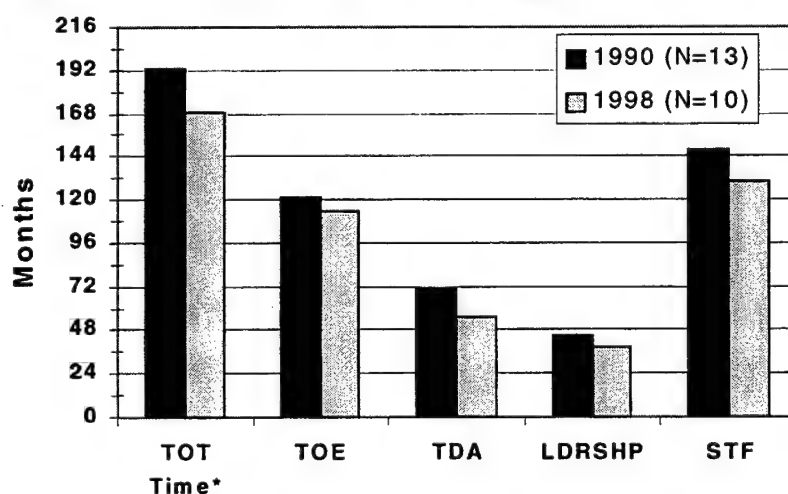
⁶² Because there were no significant changes, we did not include graphs for these positions. The interested reader can find specific data in Appendix E.

effects of declines in the tactical content of their TOE assignments to be as serious as they are for more junior officers. At this level, Majors probably held their platoon leader and company command assignments in the late 1980s and early 1990s, when training levels were high. If a firm tactical foundation was thus established, later shortfalls are likely to have had less of an impact on the continued development of these officers. However, training decreases, when coupled with fewer opportunities to serve in multiple BQ assignments as Majors, may have weakened recent S3 and XO's understanding of higher-echelon operations in particular. This could have some negative affect on their ability to effectively command at the battalion and brigade level in the future.

Brigade XO's and S3's, and Battalion and Brigade Commanders

There were not many changes in career patterns at more senior levels. For S3's, there were no statistically significant shifts, so the 1990 and 1998 comparison is not depicted here. Lower unit training rates would suggest fewer opportunities for tactical exposure while they served in their S3 jobs, but again the probability of a firm foundation established as Lieutenants and Captains in the late 1980s probably blunted much of the negative impact this could be expected to have on the tactical proficiency of officers who departed a brigade S3 assignment in 1998. As shown in Figure 5.15, brigade XO's in 1998 came

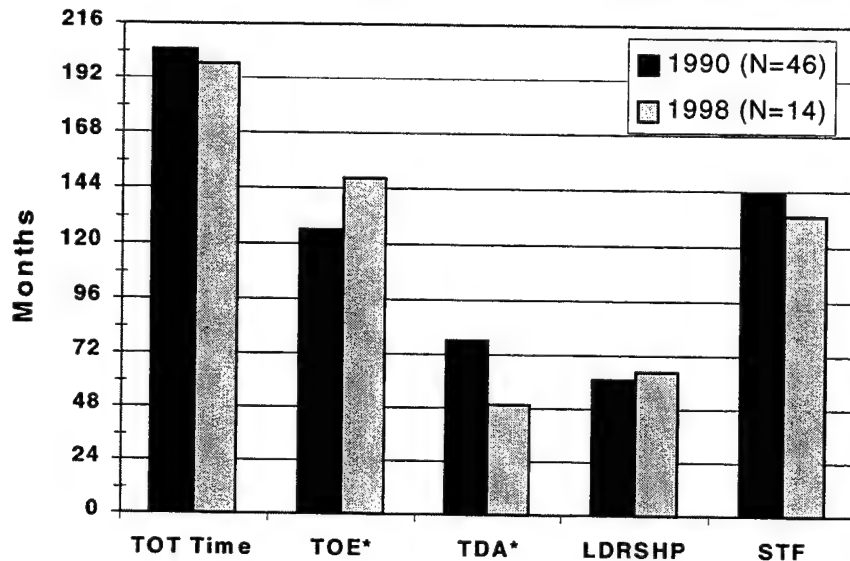
Figure 5:15: Career Histories, Brigade XO's (AR Officers)



into their assignments with about 24 months less total time in unit assignments than had earlier XO's, and averaged less time in all types of

positions (TOE and TDA, and leadership and staff), though none of the declines within these categories were statistically significant. For these officers, less time in units and less training over time within those units probably means that tactical opportunities decreased, though once again the net effects may not be as serious as for younger officers.

Figure 5:16: Career Histories, Battalion Commanders (AR Officers)



Battalion commanders in 1998 had spent 22 months more time in TOE unit positions than had outgoing commanders in 1990, a rise offset by a 28-month decline in time spent in TDA assignments. The addition of two years of exposure to training events can only be expected to have increased tactical opportunity, although whether this compensated for the falls in assignment content depends on when those TOE assignments took place and the level of unit training that prevailed at the time. In general, however, it seems unlikely that the level of tactical expertise would have fallen for battalion commanders between 1990 and 1998, and it may well have increased.

Finally, there were no significant changes in the career histories of brigade commanders. Whether declines over the 1990s in training exposure are likely to have had a major effect on the tactical expertise of these officers depends largely on the soundness of their tactical foundations, which would have been primarily constructed early in their careers. That is, whether these officers had a firm grounding in

tactics would depend in large part on the levels of training during their early assignments (i.e., as platoon leaders and company commanders), which would have been in the early to mid-1980s and about which we have no data. The training declines over the 1990s documented here likely reduced the amount of practice they were able to engage in as brigade commanders, relative to their peers in 1990, although our sample does not give enough statistical power to be certain. Overall, then, any tactical deficiencies for brigade commanders, relative to like officers in 1990, are likely to be at higher echelons (i.e., in their comfort with and practice in large unit movements); given slightly longer command tours at this level, however, training rates may still have been adequate to meet their tactical developmental needs.

SYNTHESIS AND CONCLUSIONS

The above discussion tied together some of the results of each of our three research hypotheses about changes in tactical exposure over time, in some detail. Table 5.1 reviews our primary findings for each of the three hypotheses.

Table 5.1: Summary of Primary Research Findings

Research Hypothesis	Infantry Officers	Armor Officers
1: <i>Tenure of key assignments is shorter</i>	True for platoon leaders overall (esp. first-time platoon leaders), Majors in their first BQ positions	True for first-time platoon leaders, battalion XO's
2: <i>Training content of key warfighting assignments has declined</i>	True: 12 month assignment in 1998 estimated to have involved three weeks less field training than it did in 1990	True: 12 month assignment in 1998 estimated to have involved nine weeks less field training than it did in 1990
3: <i>Officers arriving in key assignments with less tactical exposure</i>	True for platoon leaders, false for company commanders	True for platoon leaders, false for company commanders

In general, it appears that many of the anecdotal concerns about declining expertise are empirically supportable, at least in part. Put differently, while we did not find evidence for all of the expected

changes, it is clear that there are some differences in the experiences of today's officers relative to their predecessors earlier in the 1990s.

Table 5.2 summarizes the "bottom line" in terms of the likely effects these changes may have had on the tactical expertise of Infantry officers. Table 5.3, which follows, presents the same information for Armor officers. Both show that the largest departures from earlier levels of tactical proficiency are likely to be for Lieutenants.

Table 5.2: Net Effects of Changes in Assignment Lengths and Content on Tactical Expertise (IN Officers)

Position	Length of Most Recent Assignment	Tactical Content of Most Recent Assignment	Time Spent in Prior Assignments	Tactical Content of Prior Assignments	Likely Net Effect on Tactical Expertise
PLT LDRs	First-time assignments shorter, fewer repeat assignments	Slightly down	Less time overall, less time in TOE/PLT LDR positions, more in TDA/STF	Probably less	Down, esp. for first-time PLT LDRs
CO CDRs	Longer for first-time CDRs	Slightly down	More time overall; first-time CDRs had more time in TOE/PLT LDR positions	More PLT LDR time when training lvls higher; LT foundation probably more sound	Longer assignments likely make up for much of training shortfall, no major difference
BN S3/XOs	Shorter for first-timers, decreased opportunity for repeat BQ assignments	Slightly down	More TOE, less TDA time for S3s; XOs had less total time, less on STFs/TDA	For S3s, increases in TOE time likely compensate for training decreases; for XOs, no major change	Foundations likely sound, less exposure to tactical lessons in recent BQ jobs likely weakened knowledge of BN/BDE ops
BDE S3/XOs	No significant change	Field training slightly down; no change in higher-ech events	S3s had more TOE time, less TDA; XOs had less total time, less TDA	For S3s, more TOE time likely compensates for training decreases; no major changes for XOs	Foundations likely sound, S3s maybe better
BN CDRs	Longer second commands	Field tng slightly down; no change in higher-ech events	Less time overall, more TOE/leadership time, less STF/TDA	Probable increase in overall tng exposure, despite recent tng decreases	Probably better
BDE CDRs	No significant change	Field tng slightly down; no change in higher-ech events	More TOE time, less TDA	Probable increase in overall training exposure	Probably better

Table 5.3: Net Effects of Changes in Assignment Lengths and Content on Tactical Expertise (AR Officers)

Position	Length of Most Recent Assignment	Tactical Content of Most Recent Assignment	Time Spent in Prior Assignments	Tactical Content of Prior Assignments	Likely Net Effect on Tactical Expertise
PLT LDRs	Shorter for first-time PLT LDRs	Down	More STF/TDA time (less PLT LDR for first-timers, more total time for repeat PLT LDRs)	Down	Down, esp. for first-time PLT LDRs
CO CDRs	No significant change	Down	More TOE time, more time in earlier PLT LDR assignments	More PLT LDR time probably offset some portion of training declines	Training declines likely weakened tactical foundation
BN S3/XOs	Shorter for first-timers, decreased opportunity for repeat BQ assignments	Down	No significant change	Training declines not likely to have had major effect on earlier TOE/leadership experiences	Foundations likely sound, less exposure to tactical lessons in recent BQ jobs likely weakened knowledge of BN/BDE ops
BDE S3/XOs	No significant change	Down, incl. less higher-echelon training	No change for S3s, XOs had more TOE, less TDA	For S3s, no major change; more TOE time for XOs (probably earlier in decade, so likely to have increased exposure)	No major change for S3s, XOs likely better off, but less familiarity with higher-ech operations
BN CDRs	No significant change	Down, incl. less higher-echelon training	More TOE time, less TDA	Probable increase in overall training exposure	Foundation probably better, less exposure to higher-ech training as commander
BDE CDRs	No significant change	Down, incl. less higher-echelon training	More TOE time, less TDA	Probable increase in overall training exposure	Foundation probably better, less exposure to higher-ech training as commander

The decreases in tactical exposure for young officers may essentially be a *fait accompli*, though the next chapter discusses some possible interventions to try to offset some of the probable deficiencies. Chapter 6 also explore possible policy options to increase tactical opportunities for future officers more generally, and recommends establishing a more robust system for monitoring these opportunities.

(6) POLICY OPTIONS TO IMPROVE TACTICAL EXPOSURE

Before discussing possible policy steps to increase levels of tactical expertise, the question of whether such actions are in fact required must be more directly addressed. The first section of this chapter briefly reviews trends since the end of the Gulf War that have affected tactical requirements, and argues that a broader set of tactical skills is now needed. This expansion, when compared against the declines in opportunity to develop such skills described in earlier chapters, support contentions of the existence of a tactical "gap." We therefore conclude that some changes to current policies should be pursued. The second section of the chapter outlines alternatives both to increase future levels of tactical exposure in general, and to specifically target current junior officers. The third section turns to a more strategic-level issue, and argues that the Army must improve its ability to monitor the developmental content of unit assignments more generally. Enhancing its understanding of this critical arena for leader development will allow the Army leadership to evaluate current challenges more reliably and to be more responsive to potential problems in the future. The chapter concludes by summarizing our basic research findings and discussing their broader implications for leader development across the officer corps.

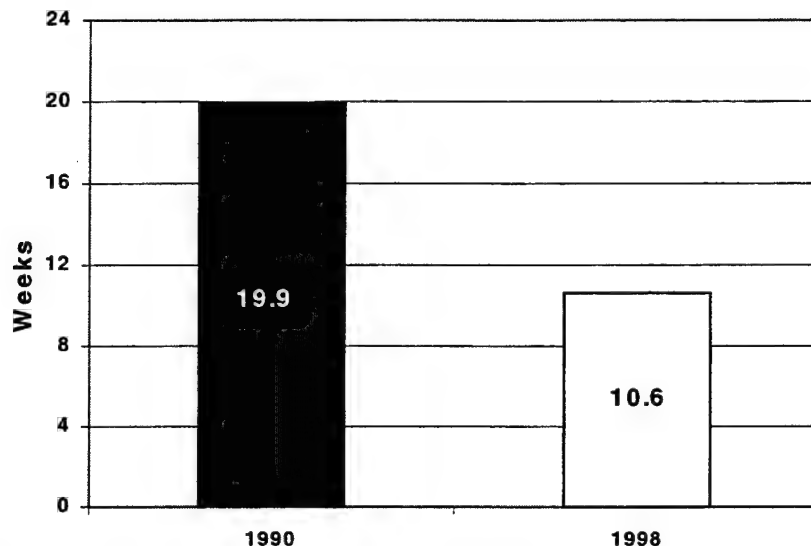
SHOULD THE ARMY TAKE ACTION?

The results presented in prior chapters described changes in developmental opportunity over time, shifts that may suggest the need for policy action. For example, Figure 6.1 below shows the estimated total number of weeks that Armor platoon leaders spent, per assignment, in home station field training for assignments ending in 1990 and in 1998.⁶³ As discussed in Chapter 5, the combination of slightly shorter assignments and lower unit training rates meant that the total amount of time that Armor platoon leaders spent in home station field training in

⁶³ The same chart, which summarizes information presented earlier, could be repeated for other groups; we have not done this here because the intent is to be illustrative.

a given assignment was estimated to have fallen by almost half over this nine-year period.

**Figure 6.1: Estimated Weeks Spent in Field Training Per Assignment
(AR Platoon Leaders)**



However, these declines do not necessarily indicate a problem. The question of whether policy interventions are needed is one of adequacy: that is, are officers' levels of tactical exposure "enough" to meet tactical requirements? The principal aim of our research was to quantify changes over the 1990s on the "supply" side, or in levels of tactical exposure received. An assessment of factors that contribute to the requirements side over the same period is needed to fully understand any potential divergence between actual and desired tactical levels.

Trends in Tactical Requirements

Our analysis assumes that the tactical "supply" in 1990 was adequate to meet tactical needs at that time, as evidenced by the successful prosecution of the Gulf War. Since then, various changes in the international security environment and the Army's efforts to address them have resulted in some of the shifts in tactical supply documented earlier.

Not surprisingly, these changes have also had an impact on the scope of tactical skills that are now required. Preparation for and execution of a broader and more complex set of missions, coupled with changes in Army forces and concepts, have expanded the requisite set of

skills that officers must now possess. The recent Army vision stresses the need for forces to be able to operate across the "entire spectrum" of conflict (Army Vision Statement, 1999), a departure from the focus on a large, conventional battle across the fields of Europe that dominated throughout much of the Cold War.⁶⁴ That is, officers must now be prepared not only to fight in a large-scale, force-on-force battle against a foe armed with tanks and other traditional military equipment, but also to engage in limited applications of force during peace operations (POs), to employ diplomatic skills in POs and other humanitarian assistance missions, to prevail in terrorist engagements, etc. Many of these missions may imply new tactics; for those that share the tactics that have historically been part of the Army's training program, they may need to be exercised under a more diverse set of conditions or to different standards.

At the same time, the conception of the warfighting mission along that spectrum has come to encompass a more diverse set of threats such as cyberattack, bio-terrorism, and other asymmetric strategies (*Joint Vision 2010*, 1997:11). Thus combat has become more complex; operating on a battlefield when civilians and combatants are indistinguishable⁶⁵, when technologies are rendered moot by enemy attack, or when chemical or biological weapons have been introduced greatly complicates the employment of forces. These challenges also imply that officers will require more creativity and a more diverse set of tactical options in the future (Halpin, 1995), and an ability to "adapt to the unexpected" (Hickling, 1998: 45). Further, many consider it likely that the need for independent judgments will be pushed to lower levels of command (Bass, 1997): one Australian general wrote that one of the "fundamentals" about future warfare is that junior commanders will have "enormous responsibility" for tactical decisions that will have wide strategic implications (Sanderson, 1998: 5).

To address this complexity, the Army is adapting both its training and force organization. An updated training strategy that more closely

⁶⁴ The Army has performed missions across this spectrum throughout its history, but has traditionally viewed them as "lesser-included cases" (Taw, et. al, 1998).

⁶⁵ Van Creveld calls this the "outstanding characteristic" of future wars (van Creveld, 1998: 29).

reflects the new operational environment is expected to be released in the spring of 2000 (Naylor, 27 December 1999: 14), and will incorporate such challenges as urban guerillas, more technologically-advanced opponents, and the presence of civilians. The Army's new brigade design (Shinseki, 1999) is also aimed at increasing operational flexibility, and fully exploiting the capabilities imbedded in its organization and equipment will require officers to master additional operational concepts and skills.

Even a cursory review of these trends suggests that officers in the 21st century need facility in a more expansive set of tactical skills than has previously been the case. This rise in requisite tactical proficiency has occurred simultaneously with declines in some important areas of tactical "supply". Accepting the premise that tactical expertise was sufficient at the time of the Gulf War, these trends strongly suggest the emergence of a tactical "gap" in recent years, one that is likely to continue in the absence of intervention.

How Big Is the Gap?

While the above argument indicates a divergence between the supply of tactical skills and requirements, the magnitude (and thus the importance) of the gap is difficult to judge. It is possible that the growth in tactical requirements over the 1990s could in fact have been adequately met despite less time spent in training events, if the developmental quality of training opportunities had substantially improved. This argument was in fact advanced in some of our interviews. There was even broader agreement among the officers we interviewed that the Army has made great strides in institutionalizing a sound set of training procedures, which has improved the focus and developmental value of training events. In the words of one brigade commander, "we may spend less time training than we used to, but we do it much better."⁶⁶ This view has also been expressed in the writings of senior Army officers.⁶⁷ But while the training process may be superior to what

⁶⁶ Interview with the author, 19 January 1999.

⁶⁷ Brigadier General Dubik, for example, claims there has been a "training revolution" that dates back to about the late 1980s. He asserts that since that time, advances in simulation have allowed for more effective and efficient field training, and for improved combined arms training at higher echelons (Dubik, 1998). Former Chief of Staff

it once was, the officers we spoke with also related a number of intervening situational factors that they believed had a negative impact on training quality. These factors ranged from lesser-experienced officers managing and directing training events (a problem evident in our earlier analyses showing decreases in branch-qualifying time for Majors, and a greater propensity for Lieutenants to serve in staff positions) to a "compression" of the training cycle (i.e., that the same number of events were being conducted in shorter periods of time, forcing units to jump from one exercise to the next without sufficient time to properly prepare for, as well as recover, retrain, and internalize lessons derived from the earlier event) to high levels of enlisted turnover,⁶⁸ which reportedly forced some units to "spend more time on the basics, so that the ultimate level that is reached is lower than it used to be."⁶⁹

Any interpretation of data showing decreases in "time spent" must therefore be mindful of whether changes in quality are likely to have either offset or exacerbated the effects of changes in tactical opportunities. If quality is, on net, believed to be higher than it was earlier, then decreases in the amount of time spent in various activities may be more tolerable; conversely, if training quality is perceived to have declined, an even higher level of training might be necessitated. Our basic conclusion, based on our reading of the literature and our interviews with unit commanders and staff, is that while improvements in the training management system have probably resulted in more developmentally-potent training, unit circumstances have in many cases diminished this positive effect, to varying degrees. Therefore, it appears that gains in quality are not likely to have fully

General Dennis Reimer has also argued that raising the priority of training in the 1980s brought about efficiencies that enabled success in Operation Desert Storm (Reimer, 1996).

⁶⁸ The argument that the rates at which soldiers moved through jobs have increased over time was not uncommon in our interviews, but is inconsistent with the empirical evidence. Analysis shows that enlisted turbulence has remained at about the same level over most of the 1990s, apart from some disturbances stemming from policies put in place for Operation Desert Storm/Shield (Hix et. al., 1998: 11). Thus while turnover probably does have an adverse affect on training quality, it does not appear that this problem has worsened in recent years.

⁶⁹ Infantry brigade XO, interview with the author, 19 May 1999.

compensated for some of the large declines in opportunities for the "deliberate practice" of tactical skills, especially in light of our earlier conclusion that the requisite set of skills has expanded over time.

In sum, if exposure levels in 1990 were adequate to meet tactical needs at that time, then it is likely that declines in tactical opportunities, even after taking quality into account, are reason for concern. Determinations about the size of a shortfall, and thus the aggressiveness with which potential remedies might be pursued, are left to the judgment of the Army leadership. If the decision to act is taken, as appears to be warranted, various options can be considered. The next section describes alternatives that could increase officers' tactical expertise in the future.

OPTIONS TO INCREASE TACTICAL EXPERTISE

The conceptual framework underlying this research implies two policy levers for increasing expertise: either lengthening the tenure of key assignments, and/or raising the rates at which units train. However, there is significant uncertainty in both the personnel and training policy domains that may mean that other options to address leader development goals may be preferable, at least in the short term. This uncertainty stems from the complex set of factors that affect assignment lengths and unit training rates. For example, if the Army decided to try to increase the length of company commands, this could cause shortfalls in other parts of the Army that require the expertise of post-command Captains. Further, if officers are then forced to wait longer to take command, this may have an impact on their decisions to stay in the Army and cause a decrease in retention rates. It is also possible that longer commands could act as a positive incentive and increase retention rates, but effects may not be able to be accurately anticipated. On the training side, depending on how changes were implemented, an effort to increase training rates could have the effect of increasing the stress that current officers reported to us in our interviews, and encouraging officer departures. This too could have the opposite effect, though, if officers viewed such an initiative as a welcome reemphasis of their warfighting purpose. Again, predicting the

net effect would be a complicated proposition, and errors have the potential to be very disruptive.

The interrelationships among such wide and diverse policy objectives and outcomes mean that developmentally-motivated policy interventions could (a) have adverse (and potentially unintended) consequences in other areas, and/or (b) fail because other parts of the system are in flux. This latter point may be the more relevant concern. Numerous actions have been taken lately in the personnel, training, and force structure realms that could have a significant impact on both tour lengths and unit training rates.⁷⁰ In many cases, the implementation plans for these changes have not yet been clearly established or are in

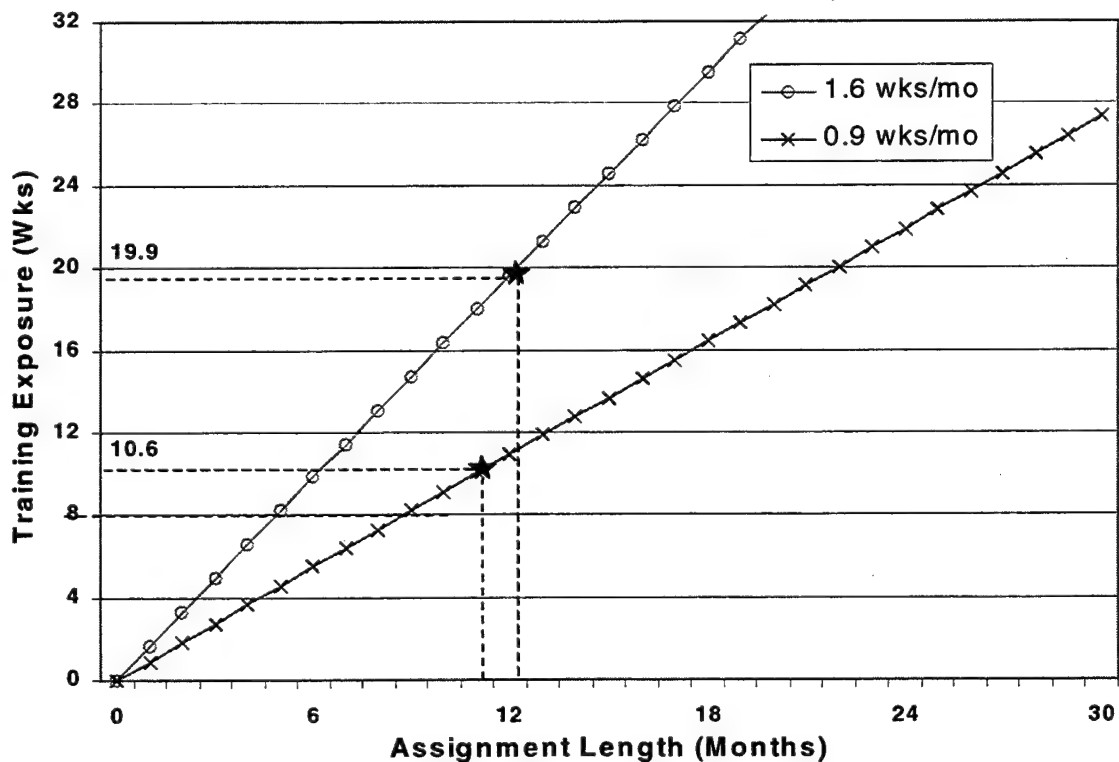
⁷⁰ For example, in the personnel area, the Army has initiated two major efforts that are likely to have an impact on how long officers would spend in key positions, though the specific outcomes are not yet clear. One of the explicit goals of the new officer personnel system, OPMS XXI, was to increase the amount of time Majors spend in branch-qualifying assignments. Second, the Chief of Staff recently announced that the Army will fill all of its officer positions by 2003 (Vinch, 19 December 1999), an objective it has failed to meet for years. Matching the authorized force structure to the number of available officers will require both cutting and/or shifting some positions and efforts to increase officer retention and recruitment. The changes that will ultimately be adopted to bring about these objectives will clearly have some effect on the number of officers that are eligible for assignment to certain types of jobs, and thus how long they can spend in them, but it is too early to reliably project the end results. In the training realm, the Army intends to field additional simulation suites, and is also hoping to replenish funds diverted for Kosovo operations (Naylor, 8 November 1999). Greater availability of simulators at home stations may increase time spent in these types of events, though whether this would cause declines in field training or take place in addition to it is not clear (it may also be that greater availability of simulators has little effect on training patterns, if availability is not the main factor inhibiting their use). And, if funds diverted for Kosovo operations are not replaced, this could result in the cancellation of some training events, thereby depressing unit training rates. Explorations into expanding available range space (a thorough discussion of which can be found in Rubenson, et. al, 1999), should they prove fruitful, would alleviate at least one training constraint that was frequently mentioned in our unit interviews. And, as mentioned above, realizing the Army's new brigade structure may affect overall training if efforts to fund the transformation stretch to include reallocation of training dollars, at least in the short term, and/or some shifts in the types of events that are conducted. These are just a few of the ongoing changes that suggest that the combinations of assignment lengths and training rates we observed in 1998 may not hold in the future, though whether total training exposure will rise or fall is impossible to determine.

flux, so the eventual effects on developmental opportunities are difficult to judge. Identifying relevant and appropriate policy targets in the face of such uncertainty would be a significant challenge.

Even if these concerns can be effectively overcome, the potential magnitude of the changes required to address tactical exposure through either mechanism (increasing either assignment lengths or raising training rates) could present another significant impediment. To further illustrate this point, the next set of figures demonstrates how targets for assignments and/or training rates might be derived from our earlier research.

The total number of weeks that Armor platoon leaders spent in field training in 1990 and 1998 that were displayed in Figure 6.1 above were derived from the combinations of average assignment lengths and estimated training rates depicted in Figure 6.2 below. The figure shows that in 1990 the average Armor platoon leader served for 12.2 months, and units to which such officers were assigned spent about 1.6 weeks per

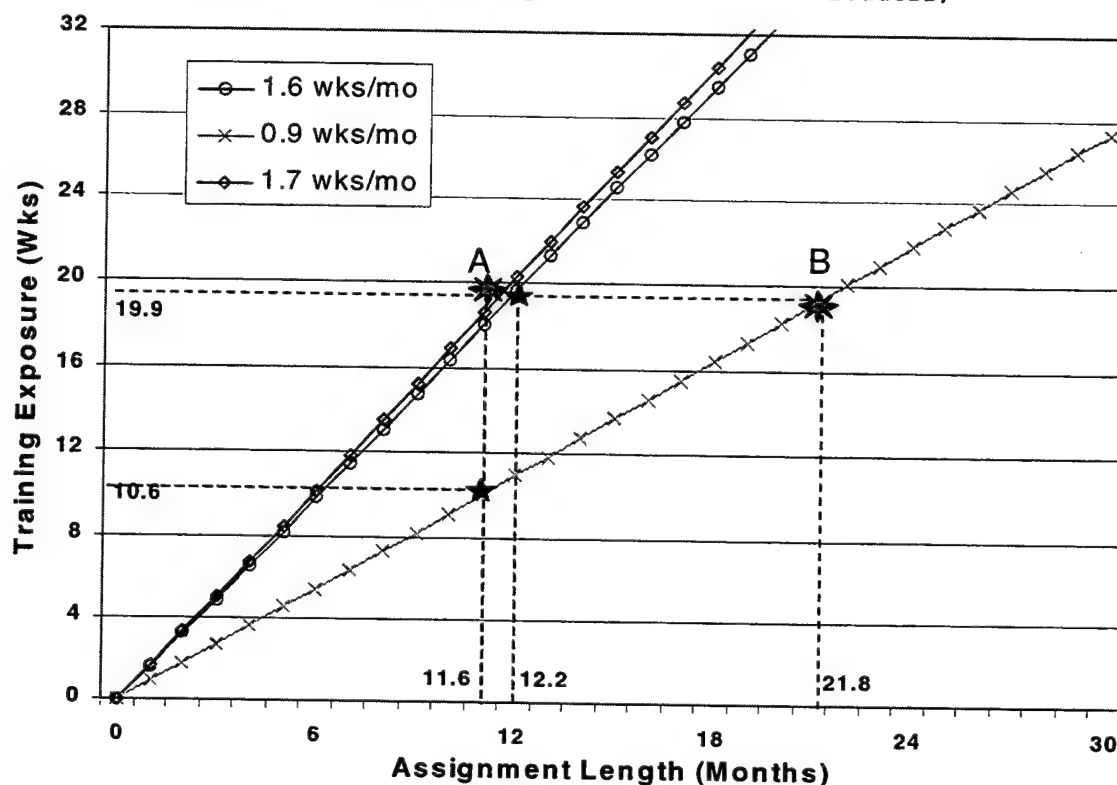
**Figure 6.2: Assignment Lengths and Unit Training Rates
(AR Platoon Leaders)**



month in home station field training. This combination led to an estimated average of 19.9 total weeks spent in home station training per assignment. By 1998, the unit training rate had fallen to just under one week per month in the field, and the average assignment was slightly shorter (11.6 months); together, these led to an average of 10.6 weeks of exposure to home station field training during a platoon leader assignment.

If the Army made the decision that a return to 1990 levels of exposure to field training would adequately prepare officers to meet current challenges, this framework suggests that these levels could be achieved either by lengthening platoon leader assignments or by increasing unit training rates. Figure 6.3 shows three basic options

Figure 6.3: Changes in Assignment Lengths or Training Rates to Increase Levels of Training Exposure (AR Platoon Leaders)



that would produce this result. The first assumes that the training rate is held constant at 0.9 weeks per month (the 1998 estimate); in this case, platoon leader assignments would have to average 21.8 months in length, almost double the tenure of such positions in 1998. A second option would be to increase the rate of unit field training, assuming

assignment length is held constant. If platoon leader assignments remained at an 11.6 month average, units would have to increase the rate at which they trained to about 1.7 weeks per month (a 53 percent rise) in order to expose junior officers to 19.9 weeks of total home station field training. A third option would be to adjust both assignment length and training rates; the line AB in the figure represents the possible combinations of higher training rates (which would be depicted as steeper "rays" in our figure) and longer assignments that would result in a level of training exposure equal to the estimated average in 1990.

This example makes clear that, in some cases at least, modifications in either assignment lengths or unit training policies for the purpose of increasing officers' tactical exposure could require significant departures from current practices. Justifying such sizeable actions solely on the basis of leader development objectives would be organizationally challenging, and potentially infeasible.

Given the difficulties described above, identifying policy options within the boundaries of existing personnel and training practices may be most promising, at least at present. Possibilities include improving the developmental quality of existing events, and/or increasing tactical opportunities for individual officers rather than entire units.

Improving Developmental Quality

Any initiatives to improve training quality must be balanced against the cultural tradition of allowing commanders to execute a general training intent as they see fit. But even within the limitations this tradition implies⁷¹, there are some options available to enhance the developmental value of existing events. These include:

- **Strengthening officers' understanding of and ability to effectively employ mentoring and coaching.** Consistent with earlier research (e.g., Stewart, 1992; Stewart and Hicks,

⁷¹ The value of this tradition of empowerment, which is embedded in the policy of giving subordinate commanders training intent but allowing them to develop a plan of execution, has been repeatedly emphasized in the leadership literature. See Bass, 1997; Campbell, 1992; Harback, 1993; Kirkland, 1990; Malone, 1992; Stewart, 1992; and Taylor and Rosenbach, 1996, among others.

1992), our interviews revealed that officers are not clear about what mentoring and coaching actually entail.⁷² Clarification is needed, and should also be combined with explicit demonstrations and guided learning. This could be accomplished with more directed instruction at schools and pre-command courses, and by integrating a review of officers' efforts in After Action Reviews (AARs) conducted in home station training events and at CTCs.⁷³ A more extreme option would be to send Mobile Training Teams of experts to conduct applied instruction in maximizing mentoring opportunities at home station.

- **Re-emphasizing training doctrine, especially the preparation and assessment phases.**⁷⁴ In our interviews, we were repeatedly told that time constraints are forcing some units to focus almost exclusively on the execution of training events, and that they do not have the time to adequately prepare for, recover from, and integrate lessons from each exercise. Fully addressing this problem may require alleviating time constraints, through concerted efforts on the part of senior commanders and/or by increasing funding for programs that would

⁷² Studies by the Army Research Institute offer the following definitions: mentoring is the guidance of a subordinate to enhance "professional, intellectual, and social-emotional development." Coaching, which more closely reflects what is needed here, is the "process of on-going, on-the-job training carried out regularly by an immediate superior with each immediate subordinate... and involves not only performance feedback but also constructive modeling and skill development." (Stewart, 1992: 12, Jacques, et. al, 1986). Such efforts also include formal counseling, which we found to be better understood and accepted in our interviews. (Formal counseling is addressed in detail in the Army's new leadership doctrine (FM 22-100, 1999: Appendix C).)

⁷³ Observer/Controllers (O/Cs) at the National Training Center do provide some feedback to their counterparts in units being trained - these efforts could be expanded to focus more in depth on identifying mentoring opportunities, for example (e.g., O/Cs could help officers to recognize situations where they could better integrate coaching efforts into the course of normal business), and could also be profitably extended to the other CTCs.

⁷⁴ Field Manual 25-101, Battle Focused Training, identifies three stages in the training management cycle: planning, execution, and assessment (FM 25-101, 1990).

reduce training distractors. If such relief is not forthcoming, commanders may need to adopt unorthodox methods to derive more developmental quality out of their current cycles. This means that if the entire unit does not have time to go through the preparation cycle (or perhaps not as thoroughly as it should), commanders could ensure that junior officers and other unit leaders get this opportunity in order to protect the long-term integrity of the training management system. For example, sending junior officers out for terrain walks with a senior NCO (non-commissioned officer) or other experienced officer if the commander is not available, while not ideal, at least increases the possibility that young officers will derive more value from the event than they might have otherwise, and gets them thinking beyond their existing conceptual bounds. More importantly, it ensures that junior leaders, who will be the trainers of tomorrow, know how things *should* be done, even if the current environment does not allow for ideal execution.

Increasing Opportunities For Individual Officers

Irrespective of any other efforts to raise the rates at which units train, it may still be possible for commanders to increase individual officers' exposure to tactical events. This may require departures from current practices, the practicality of which would have to be assessed in greater detail. Priority for such opportunities should probably be given to junior leaders, as establishing a firm tactical foundation is the most robust defense against future uncertainties. With these caveats in mind, the Army could further explore options that include:

- **Emphasizing "real practice" in unit Leader Development Plans (LDPs)**, shifting their focus from study or readings to Tactical Exercises Without Troops (TEWTs), sand table discussions, or other events that are more applied in nature. While most of the units we visited had LDPs in place, these were either were not being fully executed because of time pressures and/or tended to focus on discussions of shared

readings or presentations.⁷⁵ Redirecting LDPs to allow officers to put tactical skills into practice could be a more efficient use of the time available during unit assignments, as other forums (e.g., schools and self-development activities) exist during which officers can supplement this practice with study and discussion.

- **Increasing ride-alongs and check rides for unit commanders and Lieutenants on staff**, raising exposure levels by "piggy-backing" on other units' events. Although our interviews revealed that young officers serving on staffs and leading small units are already overworked, allowing them to ride along with counterparts during other units' training may give them better insights into how to organize and execute such efforts when leading their own units later on. Creating the time for officers to participate, even as observers, may be difficult and impose a burden on others in the unit, but the benefits may outweigh the costs if ways to minimize the disruption can be found.
- **Increasing Observer/Controller (O/C) and/or Opposing Force (OPFOR) opportunities at home station.** If unit training budgets cannot be increased, it may be that the benefit of other units' training can be shared more broadly. Using additional units in an OPFOR role can increase the training value for both sides; costs also increase, but presumably would be lower than they would be for two separate events. Another alternative is for officers to serve as O/Cs of other units' events, as assessing other units' training can help build useful tactical insights as well as improve interpersonal and mentoring skills. When considering such options, however, commanders should be mindful of the importance of maintaining some level of informal, non-evaluated training, as this may encourage greater initiative, creativity, and risk-taking.
- **Adding additional field exercises for young officers on unit staffs.** These could be modeled after the "Mangudai" exercises instituted by Major General Grange during his recent command of the 1st Infantry Division (Naylor, 8 February 1999). Sending 15-20 Lieutenants on an Infantry brigade staff for a three-day field exercise, for example, would cost about \$125 (in FY98

⁷⁵ Others have made this observation as well. LTC Donald Craig reports that while LDPs are common, "these programs are often ineffective because leaders view them as comprehensive LDPs although they only address one component - study" (Craig, 1999: 13).

dollars) in equipment costs.⁷⁶ Rotating officers through numerous positions during the exercise would expose them to a variety of perspectives and concerns, broadening their understanding of the total tactical picture. Of course, adding such exercise would mean "losing" the staff for some period of time, and would necessitate some additional resources.

- **For some TDA assignments, providing CTC ride-alongs and/or opportunities for O/C duties.** This option is probably easiest and least costly for officers whose TDA assignments are on posts that also house TOE units, but should be considered for other units as well. Increasing the tactical content of many TDA positions would help officers to maintain and build upon their warfighting skills, easing their eventual transition back into TOE units and bolstering their tactical base.

Beyond the options for raising levels of tactical expertise discussed above, a potentially more fruitful source of ideas resides in the commanders who have been coping with constrained circumstances on a daily basis in recent years. It may therefore be useful for the Army to

- **Survey recent and sitting commanders for additional ideas about improving developmental quality.** While some of this occurs informally, a more deliberate effort to survey commanders either during command courses or conferences or in the field could yield innovations that could be easily and fruitfully expanded to the force at large.

Addressing the Experience "Trough"

Recent declines in tactical exposure may also mean that current junior officers are not as well-prepared to guide those who will follow as might be desired. A basic assumption imbedded in the nature of the Army's closed labor market is that today's trainers (i.e., more senior officers) are sufficiently tactically astute to provide meaningful

⁷⁶ This estimate is derived from a FORSCOM average cost per mile of \$0.41 in FY98, and assumes a 50-mile average for each of six HMMWVs over the course of the exercise. A similar exercise in an Armor brigade would be much more expensive. Again using a FY98 FORSCOM average of \$395.61 per mile, the equipment costs for an exercise involving four tanks each driven for 150 miles would be \$237,366. Data was obtained from the Army Cost and Economic Analysis Center's OSMIS database, accessed on 24 January 2000.

guidance to their subordinates. The results presented in earlier chapters suggest that this assumption may have become more tenuous in recent years, especially for Lieutenants (and to a lesser degree for Captains and Majors). Thus some additional, short-term actions might be required to specifically address this "experience trough" for these officers. Options include:

- **Increasing opportunities for applied tactical practice at the Captains Career Course, and perhaps the Command and General Staff College.** Adding field exercises would of course require additional resources. These should be assessed against both the benefits for future training quality, and the fact that developmental value of subsequent assignments will also be increased if tactical shortfalls are rectified.

If costs and/or time preclude adding exercises, there is at least one alternative (or additional) option:

- **Bypass or supplement the experience of current junior officers with expertise of more senior (presumably more tactically sound) officers.** This could be done informally, by increasing local oversight of unit training and leader development plans, or more formally with specialized teams of tactical experts who could review unit procedures and training processes and methods. That is, the preparation of officers (in this case, probably Majors) may be considered to be inadequate for providing clear guidance and oversight of training plans not only at their own echelon (i.e., battalion and potentially brigade), but also for subordinate units' plan. If so, additional oversight might be required, either from commanders or from higher-echelon staffs.

IMPROVED OVERSIGHT OF THE CONTENT OF UNIT ASSIGNMENTS

While any or all of the above options could be pursued to increase officers' opportunities develop tactical expertise during their unit assignments, there is a larger, more systemic issue the Army should address. Effective operation of its entire leader development system is likely to remain a challenge in light of the fluid environment both within and outside the Army. Meeting this challenge requires a more

robust system of monitoring and feedback, especially of the content of unit assignments.⁷⁷

An ideal system would explicitly identify both the requirements for and the supply of tactical skills. On the requirements side, existing work should be synthesized and expanded upon to assess the set of desired tactical skills.⁷⁸ However, these efforts would have to go beyond merely identifying the skills themselves, to assess the level at which they are needed (i.e., which skills are needed at which points in an officer's career) and the intended mechanism(s) for developing them (i.e., unit assignments, formal schooling, and/or self-development). Successful specification of this system, with enough detail to be actionable, may unfortunately be impractical or even precluded by the uncertainty inherent in the current national security environment.

The Army should also establish a procedure for evaluating the supply of tactical skills, in order to determine whether it is diverging

⁷⁷ A more detailed understanding of officers' (and indeed all military members') deployment rates, one aspect of their activities during an assignment, is in fact being pursued for reasons other than leader development. Congressional interest in the amount of time personnel spend away from home has grown since the early 1990s as concerns have been raised about effects of absences on readiness and individual quality of life. As a result of language included in the FY00 Defense Authorization Act, beginning in October 2001 all of the services will be required to provide additional compensation to personnel who spend more than 250 days away from their home stations during a given calendar year. This requirement is prompting an evaluation of the ability of existing data systems to accurately report this information. The Army is currently assessing its ability to comply with the legislation, and its options to improve upon current data sources. However, these data focus on time away from home station, which is only one (and a smaller) piece of the information of interest here. That is, even if the Army improves its ability to identify time spent deployed to various training and operational missions, the data will not include time spent engaged in home station training activities, which, at least at present, represents the majority of most Army assignments.

⁷⁸ Some conceptions of tactical requirements already exist implicitly in Army-wide documents, at subordinate levels in the organization (e.g., at branch schoolhouses, elsewhere in the Training and Doctrine Command, or in the Army Headquarters Staff), and in the broader military and civilian literature. See, for example, Bass, 1997; Brass, 1996; Center for Army Leadership, 1999; Chilcoat, 1995; Hooijberg et. Al., 1996; McLachlan, 1998; OPMS Precursor Study, undated; Sanderson, 1998; Smith, 1998; Stewart, 1992; and Stewart and Hicks, 1992, to name just a few.

from desired levels. There are two primary metrics that could be used in this assessment: time spent in certain events (as was used in this work) or a more direct assessment of tactical expertise itself. Information about the former is likely to be easier to access, but does not account for quality or natural ability and is thus less complete; information about the latter is more relevant, but may be more difficult to gather.

Time Spent in Tactical Events

Monitoring exposure levels, or the amount of time spent in various activities, would require evaluating both career patterns and training rates. This in turn would necessitate:

- **Improving the quality of personnel data**, either by passing the burden for greater specificity and consistency to unit personnel clerks or by dedicating staff to this effort at the Army's Personnel Command; and
- **Collecting training data**. At the unit level, this could be done in a variety of ways, to include:
 - **Monitoring executed training miles on weapons systems and ammunition expenditures**. These data are already maintained by the Army training and budget communities. This metric is more appropriate for unit types whose training is closely tied to weapons systems than for those that operate more independently;
 - **Expanding the collection of train-up data at the CTCs**. Currently, some of the CTC O/C teams require rotating units to submit information either prior to or on arrival about how they prepared for their rotations. This information could be standardized and collected centrally. It would not represent the entire force (only those units that attended a CTC in a given year), but would provide some basis for temporal comparisons; or
 - **Developing a centralized database using unit training calendars and Quarterly Training Briefs (QTBs)**. Though these internal unit documents are prospective and may not reflect last-minute changes to planned events, if they

were collected centrally⁷⁹ they may provide the most accurate and complete set of information about unit training activities available from existing sources.

Tracking activities at the unit level may be sufficient for these purposes, and may not require much additional effort.⁸⁰ But if unit experiences diverge from those of individual officers, a more detailed approach would be needed. (As a caution, collecting data about participation in activities at the individual officer level should be done in a way that does not allow it to be identified with a specific person, as this could create either the impression or the reality of retribution against those with lower levels of exposure, which would not be the intent of such efforts.) Options to gather data similar to those we collected for this study include:

- **Surveying officers directly**, either when they are attending Army schools or through the Internet as they exit key positions;
- **Surveying commanders about their subordinates' experiences**, perhaps during conferences or higher-echelon pre-command courses;
- **Expanding upon current reporting methods to develop a data collection system for individuals' off-post deployments to include home station training events; or**

⁷⁹ This could be done either through Army channels or by outside agencies. In fact, RAND began such an initiative for the Army's heavy brigades as part of a project for U.S. Army Forces Command. However, these efforts were suspended when more urgent analytic needs came up, and the database under construction has not yet been completed. See Hallmark, et. al, "Constructing a Database on Training Activity and Time Allocation for Army Heavy Brigades," DRAFT DRR-1993-A (RAND, Santa Monica, CA) 1998, available with permission of the sponsor.

⁸⁰ Such information might also prove useful in other areas. For example, it could aid in resource allocation, in illuminating readiness issues, in identifying areas of potential efficiencies or improvements, etc. As historian Dr. Steven Schlossman noted, the Army's training history is "surely not unrelated" to its battlefield history, yet the Army's historical efforts focus almost exclusively on the latter (private correspondence, in possession of the author). The potentially broad utility of maintaining a robust, comprehensive training history might justify pursuing such an option rather than more direct measurements of expertise, if unit-level data can both meet leader development needs and contribute in other areas of interest.

- Creating a "tear-off sheet" detailing participation in training and deployments during an assignment that could be submitted (anonymously) with an officer's Evaluation Report (OER).

Demonstrated Tactical Ability

A second option for assessing the developmental content of unit assignments is to try to measure expertise itself more directly, rather than relying on exposure as an approximation.⁸¹ One shortcoming of such an approach is that it runs the risk of being used to derive inferences about officers' skills that may not be warranted. It is critical, therefore, to use any efforts to evaluate expertise as an exercise aimed at allowing the Army to better understand the effectiveness of its leader development efforts, rather than as a reflection of the quality of the officers themselves. Ways in which expertise might be evaluated include:

- **Expanding existing efforts at Army schools to include a rated field exercise.** The information from this would be used both to provide individual feedback to the officer, but also (and more importantly for these purposes) to provide data on trends about prior unit experiences to Army senior leadership. Some branch schools (e.g., Infantry) already perform a tactical assessment when officers arrive for courses. However, these tend to be written, and to focus on demonstrating familiarity with doctrinal principles rather than on the capability to apply them in real-world situations. Inserting a short

⁸¹ This is already being done to some extent in the pilot program testing what is known as "360 degree" assessment. This multi-rater program allows officers' subordinates and peers, as well as commanders, to provide feedback on a variety of behavioral traits and skills, including tactical proficiency. While this is a useful mechanism for identifying skills in a number of different areas that an individual officer can improve upon, the data are only released to the officer being evaluated. This in fact may be a critical feature of the process, as knowledge that the officer being evaluated is the sole audience for the feedback provided could be crucial for those providing the feedback. Thus this tool, while positive overall, does not serve as an effective mechanism for oversight. (For more on the pilot program, see the Center for Army Leadership's web page, at www-cgsc.army.mil/cal/lrad/mtoe360.htm.)

exercise conducted at the beginning of a course that included rotations through various positions, rated by Small Group Instructors (SGI), would provide visibility on aggregate levels of tactical knowledge officers had derived in earlier assignments, and allow for comparisons over time.

- **Analyzing unit performance data collected at CTCs.** RAND is initiating a major data collection effort at both the NTC and JRTC to establish an objective system of monitoring unit performance.⁸² Though these data relate to only a portion of the force, they will establish a baseline and allow for trend analysis in a few years. However, they are limited in that they will relate to unit, rather than individual officer, performance, which may or may not accurately reflect the officer's level of tactical knowledge.
- **Assessments by local commanders,** if they are comprehensive and consistent, and can be aggregated at higher levels across the force. These evaluations could be modeled after the leader certification system employed at the NTC for those newly assigned to the OPFOR. This program consists of written and oral exams, terrain walks, apprenticeships, and hands-on demonstrations of knowledge, skills and ability before officers are permitted to serve in their assigned positions (Rosenberger, *Insights*, 1999). It may impose prohibitive time demands on field units. Even with time constraints, a scaled-back version would provide useful information about the level of tactical skill across the force.

Ensuring the continued viability of the Army's leader development system requires, at a minimum, additional monitoring of all three pillars (institutional education, self-development, and operational experience) if they are truly expected to operate in concert to prepare leaders for current and future challenges.⁸³ Taking action to improve

⁸² See Hallmark et. al, "Determining Training Proficiency at Combat Training Centers: Data Collection Instruments," DRAFT DRR-1954-A (RAND: Santa Monica, CA) 1998, available with permission of the Army sponsor.

⁸³ For example, advances in pedagogical effectiveness may mean that formal schooling could become shorter and/or shift in content, which would have implications for unit developmental requirements.

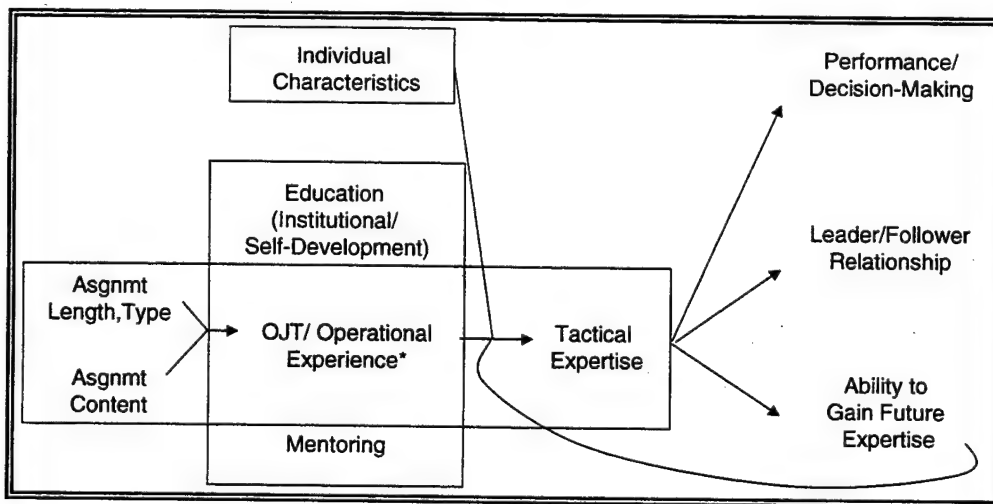
existing opportunities for tactical development will help, but will not adequately support the long-term maintenance of a sound tactical foundation for the officer corps if a systematic effort to assess unit experiences is not also put into place.

SUMMARY AND CONCLUSIONS

This dissertation began as an inquiry into whether the operational experience pillar of tactical development had weakened over the 1990s. To review, we found evidence that both Infantry and Armor officers experienced declines in opportunities to practice their tactical skills in field settings between 1990 and 1998. These declines were primarily due to lower rates of unit training, especially for Armor officers, and to some extent to shorter assignments and changing career patterns, particularly for Lieutenants and for Majors serving in their first branch-qualifying assignments.

In the context of the model presented in Chapter 2 (reproduced below as Figure 6.4), these findings indicate that the operational

Figure 6.4: Research Focus



experience of Infantry and Armor officers was different at the end of the 1990s than it had been at the beginning. Though we did not examine either officers' educational (i.e., institutional and self-developmental) experiences, or formally examine mentoring, we know of no reason to believe that any changes in either area would have offset the declines in OJT. Our model indicates, therefore, that these officers

would have lower levels of tactical expertise than had been the case in the early 1990s. By extension, they would be less adept at decision-making, face a greater challenge in building strong leader/follower relationships, and derive less tactical benefit from subsequent opportunities than had earlier officers.

This chapter has argued that these probable declines in expertise occurred at the same time that changes in the external environment increased the scope of tactical skills that might be required of combat officers. A tactical "gap" is believed to have resulted from these divergent trends, despite potential increases in the effectiveness of the Army's training management system. Further, without intervention, we do not see any reason to believe that this gap will not persist, or perhaps become larger, in the future.

Our study did not specifically address how the Army might lengthen the tenure of key developmental assignments, nor how it might increase the rate at which units train. While such efforts would benefit tactical development, changes in these areas have implications that extend well beyond the Army's leader development interests. Further, at present both personnel and training policies are in a state of flux. The complex analysis required to make useful recommendations in these areas was beyond the scope of this research, and we focused instead on ways the Army could affect tactical opportunity within the constraints of existing conditions.

We suggested alternatives both to improve the developmental quality of existing training events and to create additional opportunities for individual officers above and beyond scheduled unit events. We also recommended potential increases in the tactical content of some Army schools in order to improve the tactical knowledge of junior officers, whose experiences in recent years may not be sufficiently broad to allow them to effectively perpetuate the Army training management system in the future.

Most importantly, however, we argued that the continued tactical competence of the officer corps rests on bolstering oversight of the content of unit assignments. We suggested a number of ways this could be done, either through existing data collection methods or by establishing new ones. Until a formal feedback mechanism is put into

place, whatever form it might take, the Army will continue to have an imperfect appreciation of the developmental opportunities it is providing its officers. The absence of reliable objective information hampers the Army's ability to effectively respond to changes, whether endogenously or exogenously prompted, and thus to ensure an adequate tactical preparation for its warfighting commanders now and in the future.

Although we addressed this issue only in its tactical context, the point applies to the operational experience pillar as a whole, and more broadly to all three pillars of the Army's leader development system. The Army expects officers to apply and develop a wide range of leadership skills in their unit assignments.⁸⁴ Opportunities to practice some of these skills may be less situationally dependent than is true for tactics (e.g., interpersonal skills, which can presumably be exercised almost anywhere), but ensuring that the entire range can be effectively employed in the high-stress conditions of combat (which field training is designed to approximate) is the ultimate test. Without some sort of evaluation mechanism, the Army has limited awareness at a central level about whether the environment allows for those skills to be developed. It must instead rely on anecdote, which may be non-representative and/or misinformed, and is a shaky foundation for policy changes in an area as important as the development of its officer corps.

It would be prudent, therefore, for the Army to expand upon the suggestions offered in Chapter 6 about possible ways to evaluate tactical skills, and to develop a tool (or set of tools) to assess opportunities to develop leadership skills both in unit assignments and in other arenas as well. A more precise understanding of what units are actually able to provide would improve judgments about any required changes in the leader development system as a whole. This would in turn allow for shifts in the developmental duties and responsibilities

⁸⁴ The leadership doctrine identifies four groups of leadership skills: interpersonal, conceptual, technical, and tactical. These further vary at the direct, operational and strategic levels of leadership responsibility (FM 22-100, 1999).

between schools, units, and individual officers as the environment changes.

Our study focused specifically on Infantry and Armor officers. We did not investigate other branches; however, anecdotal evidence suggests that the problems we identify here probably hold across the combat arms branches (i.e., Air Defense Artillery, Aviation, Engineers and Field Artillery), and may also be true across the officer corps as a whole. Any assessment mechanism should therefore be tailored to provide feedback about the developmental operational experiences of officers in all branches; though the implications of this information may differ for different kinds of officers.

These efforts should be extended to and coordinated with similar evaluations of developmental goals for the Non-Commissioned Officer (NCO) population as well. Some of the experience that young officers in particular are expected to draw upon comes from senior enlisted soldiers, who are subject to the same changes in unit activities and thus may have problems with expertise as well. Understanding changes in expertise for both populations will both help to improve developmental practices for each group, and to identify areas where their interaction may need adjustment. For example, if shortages in senior enlisted personnel are decreasing the experience levels of platoon sergeants, this may have some implication for adding increased guidance for platoon leaders, who are supposed to learn from those NCOs under their command. These types of changes could be addressed in many different ways, but again knowledge of the problem must precede any remedial actions.

Finally, our research focused on increasing tactical exposure; as was alluded to earlier, tactical competence is a necessary but not sufficient characteristic for an effective officer corps. But it is possible that some efforts to increase tactical depth could come at the expense of strategic breadth. Developing officers with the appropriate levels of tactical competence at each grade, whose perspectives are sufficiently wide to meet challenges that range from prevailing in immediate operational missions to ensuring the long-term viability of the institution, requires a delicate balance that will probably shift over time. Our study is not intended to imply that tactical exposure should be maximized, with all other concerns a second priority.

Instead, we attempted to provide greater empirical illumination on a widely-perceived problem in the combat arms, and to identify possible solutions. Any actions must of course be considered in conjunction with the Army's larger interests. However, whatever balance is struck, additional information about the developmental opportunities provided to officers will certainly improve the Army's ability to achieve its leader development goals.

A. STEPS TAKEN TO CLEAN PERSONNEL DATA FROM OMF

This appendix describes our process for cleaning the assignment information about individual officers that we drew from the Officer Master File (OMF) in greater detail.

The OMF is a monthly snapshot of all officers serving in the Army at that point in time, and includes one record for each officer. Included in that record is the officer's current and last 19 assignments. For example, if a given officer is serving in his sixth assignment, there will be six positions reflected in that officer's record (usually - there are some exceptions, discussed below). For each assignment, the record contains information about the officer's rank, the unit to which he was assigned, its location, the position type, the date the assignment began, and its length in months. (There are many other variables as well, but they were not used in our analyses.) The analysis file that we derived from the OMF broke an officer's record into individual records for each assignment (and therefore several records for each officer, linked by a social security number); we used the data in this form to analyze Research Hypothesis 1 (changes in the length of key assignments) in Chapter 3, and then re-aggregated them into one record for each officer (encompassing his entire career) for our analysis of career patterns in Chapter 5.

Information about the unit of assignment and the position type are contained in free-form text fields. This means that any given position type, e.g., platoon leader, can be entered in a variety of ways (such as "PLT LDR, PLATOON LDR, PLATOON LEADER", etc.). Some entries are ambiguous, such as "Operations Officer" - this may or may not represent an S3 assignment, for example.

Because of the number of different kinds of assignments, along with the magnitude of various ways in which identical information was represented (to include misspellings), we decided that our energies were better directed towards ensuring a high degree of accuracy in identifying a relatively small number of positions than being less confident in our ability to distinguish between a larger set of

assignment types. We thus decided to focus on key leadership positions, with all other assignments defaulting into categories of either "other TOE" or "other TDA," depending on the unit of assignment.

To identify position type, we initially crafted a set of rules that searched for character strings within the duty title variable. These looked for clearly identifiable types of assignments that included LDR (leader), CDR (commander), XO, and S3; all other positions were defaulted to STF (staff). We then attempted to identify the appropriate echelon for each of the key assignments that we had chosen to focus on. For this, we searched both the duty title variable (which sometimes included information on echelon) and the duty unit variable, which also contained information about the level of the assignment. Echelons included PLT (platoon), CO (company), BN (battalion), BDE (brigade), and "other". Finally, we attempted to distinguish between assignments to Armor or Infantry, other TOE, and TDA units. The split between TOE and TDA was identified by the "UNITNUM" variable, which contains the number of most TOE units (e.g., 0075 for the 75th Ranger Regiment) and partial Unit Identification Codes (UICs) for TDA units (the last four digits of the UICs, that typically began with letters indicating that the unit was part of the TDA Army). Armor or Infantry units were further distinguished from other TOE units by searching the duty unit variable, in conjunction with unit number and the location.

Once our initial categorizations had been made, we conducted a number of checks to determine how well our rules appeared to be working. For example, looking at the officer's rank in conjunction with the duty title gave clear indications of probable miscategorizations (e.g., captains who were coded as battalion commanders). We also evaluated whether the numbers of officers we were identifying in certain types of assignments were consistent with our expectations, given the Army's force structure. As we refined our coding rules, it eventually became apparent that the only reliable way to ensure accurate coding was to review each record individually.

There were some cases in which the record contained no duty title at all; we believed that this was probably due to a "lag" in entering the data, and hypothesized that files a few months later than the

extracts we were using might contain updated information. However, when we attempted to correct these blank records using later information, we found that this introduced other errors. Ultimately we defaulted to coding blank assignments as either "other TOE" or "other TDA," depending on the type of unit. If this information was also not available, it defaulted to TDA.

In some cases, records were complete but were ambiguous or seemed improbable: for example, there were cases in which Lieutenants were identified as battalion S3s. In such instances, we exercised our best judgment. In the example above, this meant deciding that this probably referred to an assignment on the battalion S3 staff, rather than serving as the battalion S3 position itself. But in situations when captains were identified as battalion S3s, it became more difficult to make such determinations; while a Captain serving as an S3 was improbable, it could not be ruled out entirely. Our practice in these cases was to defer to what was stated in the record, unless it seemed far outside the bounds of known practices.

The amount of effort required to attain a high degree of confidence even in determining the specific assignment type indicated to us that ensuring a similar standard for all data elements would require reviewing each record individually. As mentioned in Chapter 3, we thus focused on an even smaller but still robust subset of the data, and directed our efforts toward ensuring accuracy within this subset. This subset was drawn by extracting the career histories for each officer who departed a platoon leader, company command, battalion or brigade S3 or XO, or battalion or brigade command position in a TOE Armor or Infantry unit in either calendar year (CY) 1990 or CY 1998. Table A.1 below shows the percentage of total officers, by grade, the extracted group represented in both years.

Table A.1: Records Extracted for Inclusion in Data Set Analyzed for Changes in Assignment Lengths and Histories, 1990 and 1998

1990	LT	CPT	MAJ	LTC	COL	TOT
Inventory	4461	5366	2694	1603	739	14863
Exited Key Position	1512	893	280	147	26	2858
Percent	34%	17%	10%	9%	4%	19%

1998	LT	CPT	MAJ	LTC	COL	TOT
Inventory	3446	3089	1918	1317	432	10202
Exited Key Position	925	489	216	102	20	1752
Percent	27%	16%	11%	8%	5%	17%

Once this subset of assignments had been identified, we turned to "cleaning" other data elements of interest for this group. In addition to refining the accurate identification of earlier assignments in these officers' assignment histories, we also focused on the length of their assignments. Because each entry contained an assignment start date, but not a concluding date, we initially created a calculated variable derived from the difference between the two start dates of proximate assignments. However, it soon became evident that the assignment histories included a lot of time that was unaccounted for, so that the calculated assignment length variable appeared to be overestimating actual time spent in many jobs. From other information in the record about degrees awarded or course completions, we could surmise that some of this "missing" time was due to attendance at schools, but other plausible explanations appeared to be errors, other unknown causes, and occasionally breaks in service. We therefore decided to use the "length" variable included for each assignment, which was recorded in months. However, this variable had some problems as well - in some cases the number of months stated for a given assignment exceeded the months in between the start date of that assignment and the next, for example. In general, we took the "length" variable to be the accurate length of the assignment unless it exceeded the start date of the next assignment, in which case we adjusted the assignment length to the shorter period.

In some cases, the type of assignment appeared to be identical but was represented as two (or more) separate assignments - for example, in some cases when the unit deployed, which caused the "home station" data field to change, this generated a new assignment record. Treating each assignment separately would cause us to underestimate the length of the assignment, which in fact continued in both locations. In instances where the duty title and unit identification fields remained identical but location changed, the assignments were combined and the length was adjusted accordingly.

Finally, we did not include time in school in the assignment histories. This was because this information was not included consistently in the records; some contained an assignment record for the Command and General Staff College (CGSC), for example, while others showed a CGSC degree but the likely period of attendance was "missing" in the record. In order to be consistent, we removed all "student" assignments (and the associated time spent in such assignments) from the records.

As this discussion makes clear, the ambiguity and imperfections in the data made this process extremely complex, and required many judgments. Given these decisions, in conjunction with the existing imperfections in the original data we were provided, we know that the "cleaned" files are not perfect. However, we believe that the individual review of each record provided the highest possible degree of accuracy given the available information.

B. DISTRIBUTIONS OF LENGTH OF KEY ASSIGNMENTS

This appendix provides additional detail about how the lengths of key assignments, discussed in Chapter 3, were distributed. The distributions indicate how force-wide total time (officer years) in each assignment type was "spread" across a cohort of officers. For example, say that in each year there are 100 man years of platoon leader experience available, and 200 Lieutenants. Say that five percent of these Lieutenants served ten of those years (i.e., stayed in their assignments for one year each), while the other 95 percent (190 Lieutenants) served the other 90 years (i.e., stayed in their jobs for about six months each). This provides insights into the overall knowledge base as that cohort of officers advances in their careers. This appendix presents a series of figures that depict these distributions of assignment lengths, usually separated out by first-time and "repeat" position holders, for platoon leaders up through brigade XO's,¹ first for Infantry officers and then for Armor.

Each of the figures presented contains at least two "box and whisker plots," one representing a group of officers in 1990 and the other a like group of officers in 1998. (Most have four, two for first-time position holders in 1990 and 1998, and two for repeat position holders in each year.) The height of the boxes represents the "interquartile range" or IQR, which extends from the 25th percentile to the 75th percentile. This means that 75 percent of all of the officers in the represented group spent more time in the assignment than the value represented by the bottom of the box, and that 25 percent of all officers spent less time in the assignment than the value represented by the top of the box. (Put differently, the height of the box shows the "middle" 50 percent.) The horizontal line across each box represents the median length of the assignment for each group: 50 percent of the officers in the group spent less time in their assignments than this median value, and 50 percent spent more. Vertical lines at the top and

¹ Battalion and brigade commanders are discussed but graphs are not included because the numbers are so small that they are not informative.

bottom of each box stretch from the IQR to the upper and lower adjacent values. The upper adjacent value is defined as the largest data point less than or equal to the 75th percentile plus $1.5 \times \text{IQR}$. The lower adjacent value is the smallest data point greater than or equal to the 25th percentile minus $1.5 \times \text{IQR}$. Points beyond the upper or lower adjacent values, which represent the most extreme cases, are plotted separately.

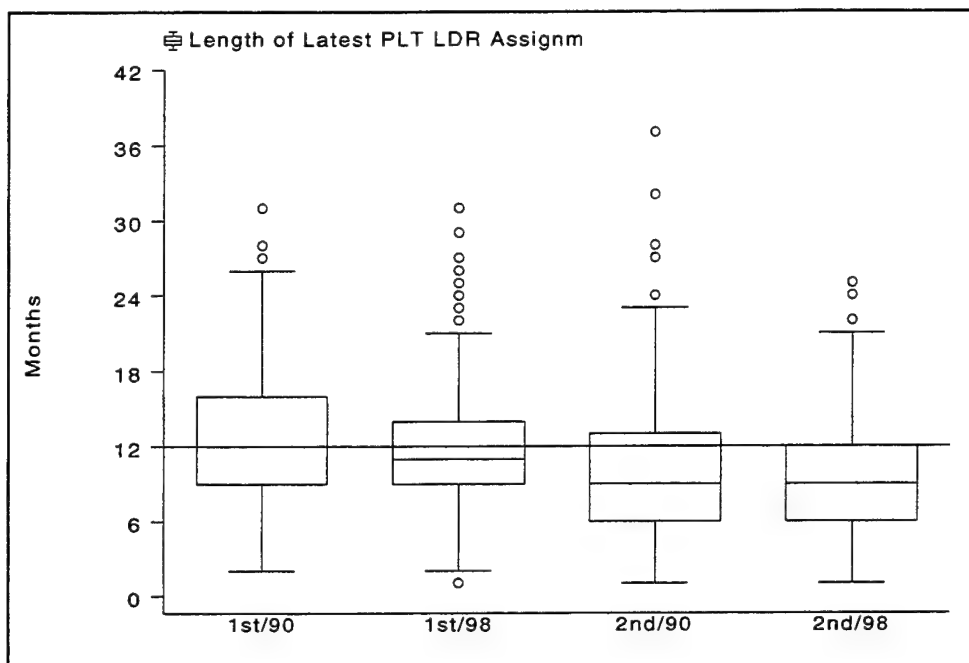
INFANTRY OFFICERS

Platoon Leaders

Table 3.1 in Chapter 3 indicated that the average length of platoon leader assignments for Infantry officers fell from 11.4 months in 1990 to 10.6 months in 1998, a decrease of seven percent. Further differentiation between first-time platoon leaders and those who had already led at least one other platoon reveals that the length of first platoon leader jobs declined more severely (from 12.7 months in 1990 to 11.4 months in 1998, a drop of over 10 percent) than did the average for repeat platoon leaders (10.2 months in 1990 vs. 9.6 months in 1998, a six percent fall).

Figure B.1 below shows the median length and distributions of platoon leader assignments held by Infantry officers in 1990 and 1998. It indicates that there was less variation in assignment length for both first-time and repeat platoon leaders in 1998 than there had been in 1990. For both groups, the 25th percentile did not change over time (nine months for first-time platoon leaders, six months for repeat platoon leaders), suggesting that those platoon leaders who only had the opportunity to serve a short amount of time in 1998 were not worse off, relatively speaking, than those in similar positions earlier in the decade. However, the 75th percentile also dropped for both first-time and repeat platoon leaders; this, coupled with lower "extreme values" for the longest platoon leader assignment, indicates that the most advantaged platoon leaders (in terms of time in position) in 1998 were

**Figure B.1: Distribution of Platoon Leader Assignment Length
(IN Officers)**



not as well off as the most advantaged in 1990. Overall, while the "floor" for platoon leader time remained fairly constant (though the median did drop by one month for first-time platoon leaders in 1998), the opportunities for officers to spend longer periods of time in the job declined between 1990 and 1998.

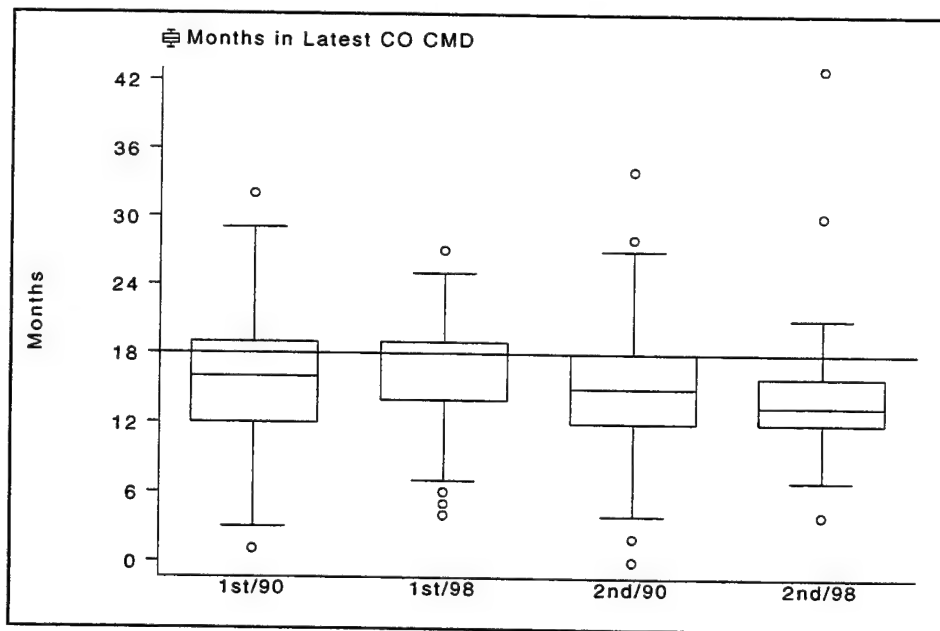
Company Commanders

Contrary to what our interviews led us to expect, the average length of a company command assignment for Infantry officers actually increased by four percent between 1990 and 1998, from 15.4 to 16.0 months. This is due to an increase in the length of first-time commands, which rose from an average of 15.7 months in 1990 to 16.8 months in 1998. Conversely, repeat company command tours fell slightly over time, from 14.7 to 14.5 months.

Figure B.2 below provides further information about the distribution of assignment lengths for first-time and repeat company commanders. It indicates that the median length of a command increased for first-time commanders from 16 to 18 months, and that the distribution of assignment lengths became much tighter, especially for

those officers in the third quartile. The range for the second quartile (i.e., those whose assignment lengths fell between 25 and 50 percent of all assignments that year) remained at four months (12 to 16 months in 1990 and 14 to 18 months in 1998), but the range for the third quartile became much smaller (16 to 19 months in 1990, 18 to 19 months in 1998). This means that a higher percentage of officers had the opportunity to serve eighteen months or more in their first company command in 1998 than had first-time company commanders in 1990, although the length of the longest commands became shorter over time.

Figure B.2: Distribution of Company Command Assignment Lengths (IN Officers)



For those officers who had previously served in another company command assignment, the median length of their second commands fell from 15 to 13.5 months from 1990 to 1998. The "floor" of the second quartile remained at 12 months, which meant that 75 percent of all repeat commanders in both years had at least 12 months in their second command positions, but the lower median coupled with a slightly compressed third quartile (3 months in 1990 vs. 2.5 months in 1998) meant that the middle 50 percent of repeat company commanders in 1998 had shorter tours than did comparable officers in 1990. Shorter "whiskers" on the box-and-whisker plots also indicate smaller extreme values, suggesting that in

general, the lowest low values in 1998 were higher than they had been in 1990, but also that the highest high values were lower than they had been earlier. Overall, smaller variance in the distribution for repeat commands indicates greater consistency in the length of second commands.

Battalion S3s

The average length of an Infantry officer's assignment as an S3 in an Armor or Infantry battalion fell by eight percent over the 1990s, from 14.0 months in 1990 to 12.9 months in 1998. This decline was attributable to declines for those Majors who were serving in their first branch-qualifying positions, who averaged 14.2 months in their S3 assignments in 1990 and only 12.8 months in 1998. For those who had previously held a branch-qualifying job, the average as battalion S3s increased from 13.0 to 14.0 months over the 1990s.²

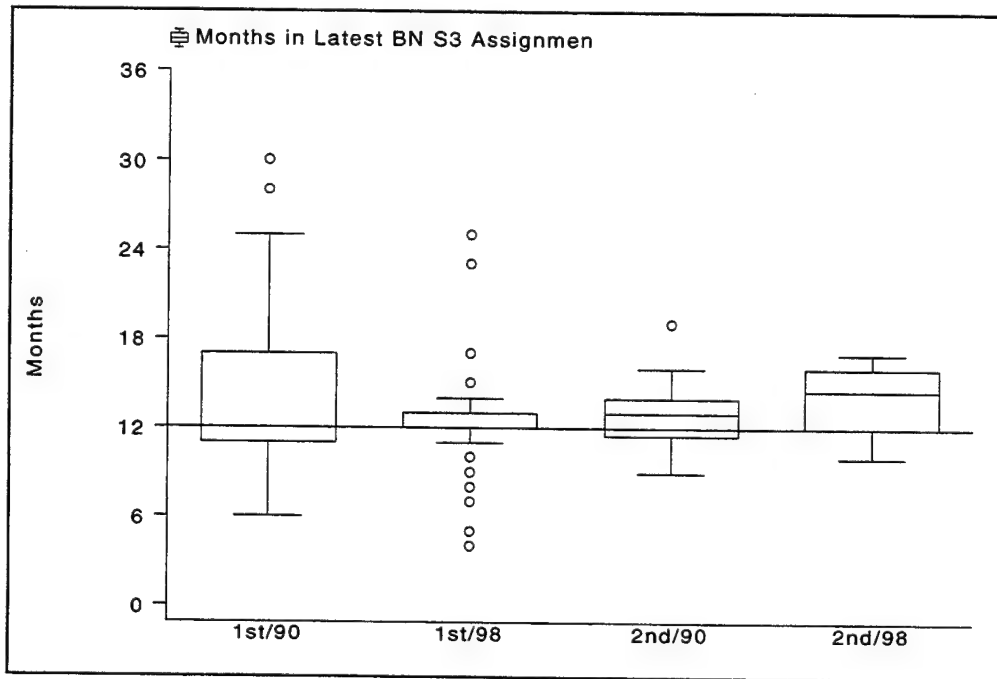
Figure B.3 depicts the distributions of the average time Majors spent in battalion S3 positions. For officers in their first branch-qualifying assignment, the median increased from 12 months in 1990 to 13 months in 1998. However, there was much less variance around this median later in the decade. The second and third quartiles in 1990 served between 11 and 17 months; by 1998, the middle fifty percent had all spent between 12 and 13 months in their S3 assignments. At the same time, the shortest battalion S3 assignments (4 months for the bottom one percent) were even shorter in 1998 than they had been in 1990 (six months for the same group). The largest change, however, appears to be the marked decline in opportunities to serve much longer than just over one year. In 1990, the top ten percent of the longest assignments were at least 22 months; eight years later this had fallen to 17 months, a 23 percent decline.

Those who had had the opportunity to serve in an earlier branch-qualifying (BQ) position were better off, on the other hand, in 1998 than they had been previously. The median for this group increased from 13 to 14.5 months, with the middle fifty percent serving between 12 and

² As was pointed out in Chapter 3, designation as a "repeat" battalion or brigade S3 or XO signifies that the officer had held at least one earlier position of these four, not necessarily an earlier assignment of exactly the same type.

16 months in 1998 (compared to between 11.5 and 14 months in 1990). The shortest assignments in 1990 were shorter than those in 1998 (nine months for the bottom one percent in 1990, ten in 1998), although the longest were slightly longer earlier (19 months for the top one percent, compared to 17 months in 1998). Overall, those with multiple branch qualifying jobs, except for those at the highest end of the distribution, spent more time in their positions in 1998 than had those with repeat BQ assignments in 1990.

Figure B.3: Distribution of Battalion S3 Assignment Lengths (IN Officers)



Overall, these trends indicate that battalion S3s leaving their first BQ job in 1998 were much more likely to have served about one year (no more, no less) than were similar officers in 1990, whose tour lengths were subject to much greater variation. Those who were serving in their second BQ job served longer, for the most part, than had repeat S3s in 1990.

Battalion XOs

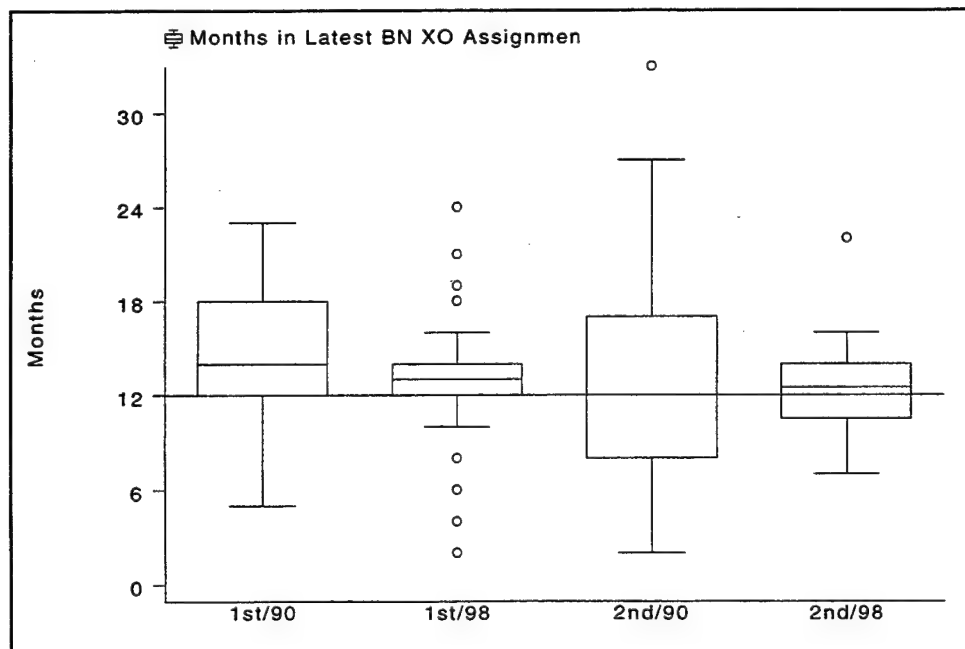
The length of a battalion XO position declined by eight percent between 1990 and 1998, from an average of 14.0 to 12.8 months. The fall

was more severe for Majors whose XO assignment was their first in a branch-qualifying position; this group averaged 14.5 months in 1990 but only 12.9 months in 1998, an 11 percent decline. For Majors who had already held at least one other BQ assignment, the length of their XO positions fell by five percent from 13.3 months in 1990 to 12.6 months in 1998.

Figure B.4 illustrates the distributions of the length of battalion XO assignments for those officers who left their first BQ assignments (in this case, as battalion XOs) in 1990 or 1998, and then for those who had previously held at least one other BQ position. As with battalion S3s, the most obvious trend is toward a tighter distribution around the median for both groups.

For first-time BQ Majors, the median length of their battalion XO jobs fell over the 1990s by one month, from 14 to 13 months. Despite this decline, the bottom of the second quartile remained at 12 months, so that 75 percent of all first-time XOs served at least one year in both 1990 and 1998. A larger change was evident for the third quartile

Figure B.4: Distribution of Battalion XO Assignment Lengths (IN Officers)



(those officers whose assignments were longer than 50 percent of all other officers but shorter than the top 25 percent): in 1990, the range of assignment length for officers in this quartile was between 14 and 18 months; by 1998, this had dropped to between 13 and 14 months. Thus while 50 percent of all outgoing battalion XO's in 1990 had served in their jobs for at least 14 months, the same was true for only 25 percent of all outgoing XO's in 1998.

For officers who had already held at least one other BQ assignment, the median actually increased between 1990 and 1998, from 12 to 12.5 months. The second and third quartile at the beginning of the decade served in their XO positions for between eight and 17 months; by 1998, this range had been reduced to between 10.5 and 14 months. The "least fortunate," in terms of assignment length, were therefore not as bad off in 1998 as they had been in 1990, but the "most fortunate" had also spent less time in their battalion XO positions.

Brigade S3s

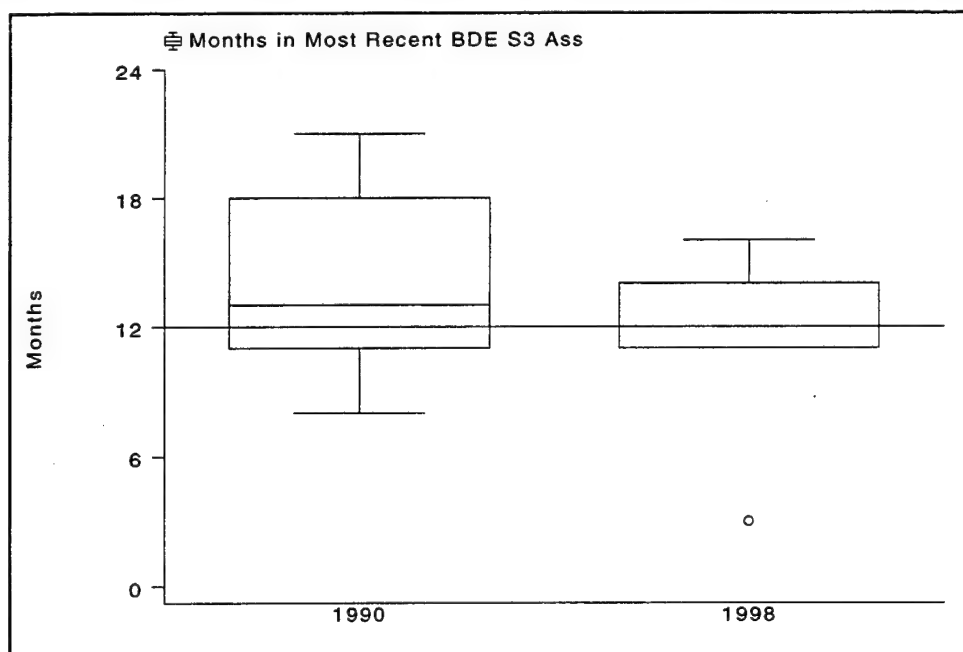
Infantry officers leaving a brigade S3 position in 1998 had, on average, spent one month less time in that position than had similar officers in 1990 (13.2 vs. 14.2 months, an 8 percent drop). In both years, the vast majority of S3s had previously held at least one other BQ assignment as a Major (15 of 21 in 1990, or 71.4 percent, and 18 of 23 in 1998, or 78.3 percent). However, of the small number for whom the brigade S3 position was their first BQ assignment (N=6 in 1990, N=5 in 1998), the average length of that assignment increased by 19 percent from 14.3 months in 1990 to 17 months in 1998. The decline in the overall average was driven by the 14 percent fall in assignment length for S3s with prior BQ experience, from 14.2 months in 1990 to 12.2 months in 1998.

In both 1990 and 1998, the total number of officers for whom the brigade S3 assignment was their first BQ assignment was fairly small, so that plotting the distribution of their assignment lengths is not very meaningful; a direct comparison of their assignments is more telling. In 1990, the six officers for whom the brigade assignment was their first BQ position served for 11, 11, 12, 15, 17, and 22 months; in 1998,

the five who fell into this category served for 12, 12, 13, 22, and 25 months. It thus appears that the minimum tenure increased slightly over the 1990s, and that there were more opportunities, in both real and percentage terms, to serve for longer in the brigade S3 job later in the decade.

Figure B.5 illustrates the distribution of the length of brigade S3 assignments for officers who had had prior BQ experience. In this group, the median length of their assignments fell (from 13 months in 1990 to 12 months in 1998), and there was less variance. In both years, at least 75 percent of all brigade S3s in their second (or more) BQ position served at least 11 months, although opportunities to serve for exceptionally long periods of time in the S3 position were also reduced. In 1990, 50 percent of all exiting brigade S3s had spent between 13 and 22 months in their jobs. By 1998, the range for the top half was only 12 to 16 months.

Figure B.5: Distribution of Brigade S3 Assignment Lengths (IN Officers)



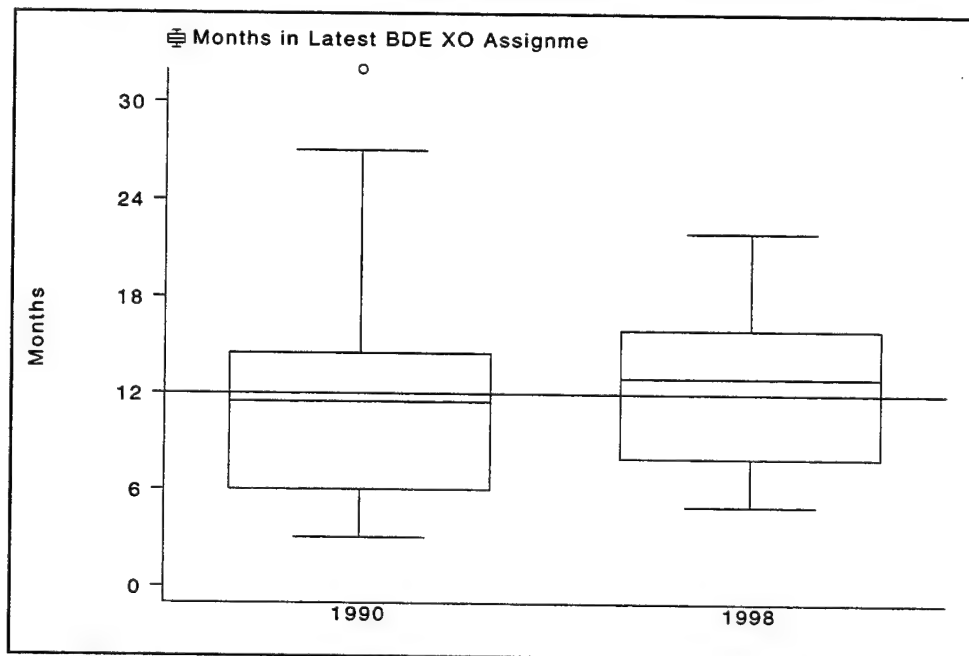
Brigade XO's

With one exception in 1990, all outgoing brigade XO's in both 1990 and 1998 had held at least one other previous BQ position; the

distinction between those with prior BQ experience is therefore not useful for this group, and will not be maintained. On average, the length of brigade XO assignments increased from 11.9 months earlier in the decade to 12.2 months by 1998, a three percent rise.

Figure B.6 shows the distributions for exiting XOs, and indicates that for most, time in this assignment increased between 1990 and 1998. Half of all XOs in 1990 served over 11.5 months, which rose to 13 months by 1998. The longest assignments in 1990, however, were still longer than those in 1998: ten percent of all outgoing brigade XOs held these positions for between 22.5 and 32 months in 1990, compared to between 19 and 22 months for the top ten percent in 1998. Overall, then, it appears that most outgoing brigade XOs spent slightly longer in their

**Figure B.6: Distribution of Brigade XO Assignment Lengths
(IN Officers)**



jobs in 1998 than they had had at the beginning of the decade, despite some decreased opportunity to serve for very long periods of time.

Battalion and Brigade Commanders

While assignments to the positions discussed to this point are typically managed by local commanders, field-grade command assignments are managed centrally by the Army's Personnel Command (PERSCOM). Their

length has therefore been fairly consistent over time, at about two years. Battalion commands averaged slightly longer (seven percent) in 1998 than in 1990 (25.3 months vs. 23.5 months). This was principally due to longer second commands; these accounted for a small proportion of outgoing commanders (eight officers -- 18 percent -- in 1990, and four officers - 13 percent -- in 1998) but became more consistent and longer in 1998 than they had been earlier. First-time battalion commands rose from 24.7 months to 25.1 months over the course of the decade; the average for those serving in their second commands increased by almost 30 percent, from 18.5 months in 1990 to 26 months in 1998.

The average length of a brigade command tour increased by about four percent between 1990 and 1998, from 23.7 to 24.5 months (there were no repeat commanders). This rise was almost entirely due to one very short (16 month) command in 1990. If this assignment is excluded, the average command length in 1990 was 24.4 months, and 24.5 months in 1998.

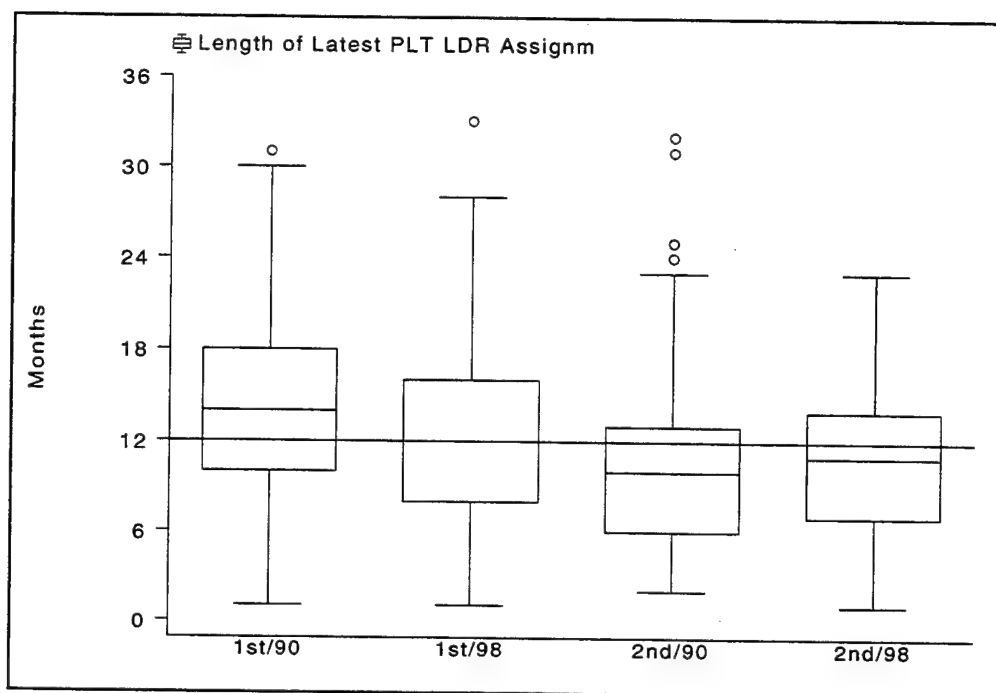
ARMOR OFFICERS

Platoon Leaders

The average length of a platoon leader assignment for Armor officers fell by about four percent between 1990 and 1998, from 12.2 to 11.6 months. However, these declines were more pronounced for first-time platoon leaders: in 1990, the average Lieutenant exiting his first platoon had served 12.3 months in the job; by 1998, equivalent officers left after only 10.1 months, an 18 percent decline. On the other hand, the length of platoon leader assignments for those who had already served in that position at least once actually increased slightly, from 10.1 months in 1990 to 10.7 months in 1998.

This trend of less experience for first-time platoon leaders and more for repeat platoon leaders is further illustrated in Figure B.7, which shows the distributions of platoon leader time. For first-time platoon leaders in the second and third quartiles, the variance stayed constant (four months less than the median to four months more), but the median dropped by two months, from 14 months in 1990 to 12 months in

**Figure B.7: Distribution of Platoon Leader Assignment Lengths
(AR Officers)**



1998. Overall, then, most Armor officers spent less time in their first platoons in 1998 than had officers in similar positions in 1990.

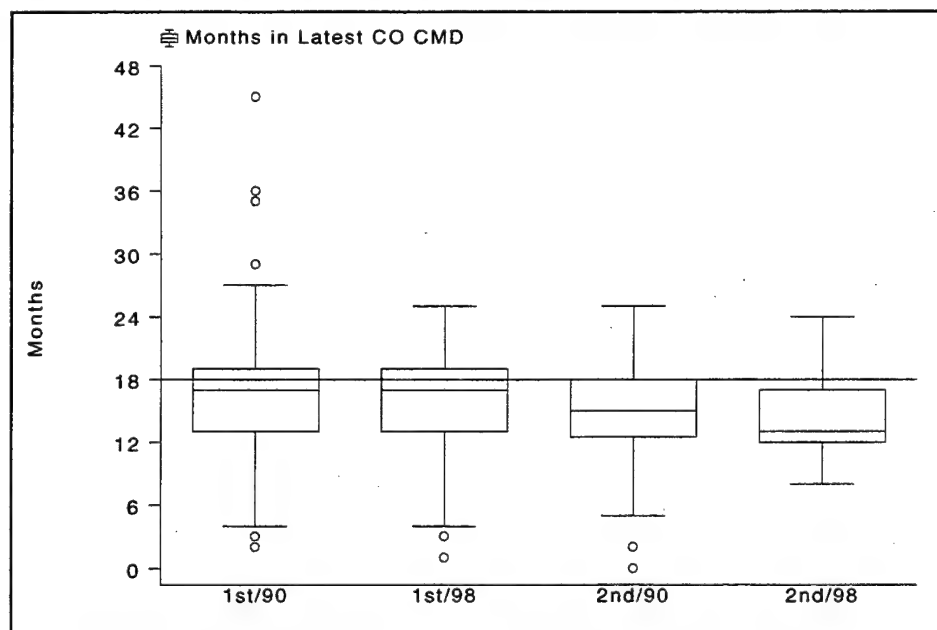
The second and third quartile distributions for repeat platoon leaders were also the same between 1990 and 1998 (four months less than the median to three months more), but the median increased from ten to 11 months. This indicates that most second- (or more) time platoon leaders in 1998 had more time serving in their positions than did repeat platoon leaders in 1990.

Company Commanders

On average, the length of company commands for Armor officers fell by three percent over the 1990s, from 15.8 months in 1990 to 15.4 months in 1998. There was almost no change in the length of first commands (16.2 months in 1990, vs. 16.0 months in 1998). For those who had already served in at least one other company command assignment, however, their most recent commands fell by three weeks (five percent) to an average of 14.1 months in 1998.

Figure B.8 indicates that for first-time commanders there was almost no change in the distribution of assignment lengths, except in the most extreme cases. The median in both years was 17 months, with the fifty percent represented by the second and third quartiles falling between 13 and 19 months. Those who fell in the bottom 25 percent also appear to be about the same (except for one slightly lower value in 1998 at around two months). The largest change was evident for those at the higher end of the distribution, i.e., those who held command for exceptionally long periods of time. In 1990, ten percent of all company commanders had been in their first command for 23 months or longer; by 1998, this had fallen to 20 months. Even more extreme cases were apparent in 1990, when a few officers stayed in position for almost three years. Many of the longest assignments were in cavalry regiments; the reason they were so long is not known, nor is it clear why there were no such cases in 1998. (It may be that the Gulf War was a factor, although they did leave their positions in 1990, presumably before the war began.)

Figure B.8: Distribution of Company Command Lengths (AR Officers)



For second-time commanders, the median company command tour fell from 15 to 13 months between 1990 and 1998. However, the shortest assignments for those in the second quartile (those between 25 and 50

percent of all who left that year) did not fall by much: in 1990, the range was between 12.5 to 15 months; in 1998, the range was between 12 and 13 months. Further, the bottom 25 percent in general served shorter assignments in 1990 than they did in 1998. These numbers indicate that while the bottom half of repeat company commanders in 1998 was slightly disadvantaged in the longest commands they held (relative to the bottom half in 1990), the "floor" was higher (10 months for the lowest five percent in 1998, compared to 6 months in 1990). The range for the third quartile was slightly wider in 1998 than it had been earlier (three months (from 15 to 18) in 1990, vs. four (13 to 17) in 1998). Again, the highest extremes were also lower for repeat company commanders in 1998 than they had been earlier. Thus even those officers who enjoyed the longest second commands in 1998 still spent less time in those jobs than did the most fortunate (i.e., the top 50 percent) repeat company commanders in 1990.

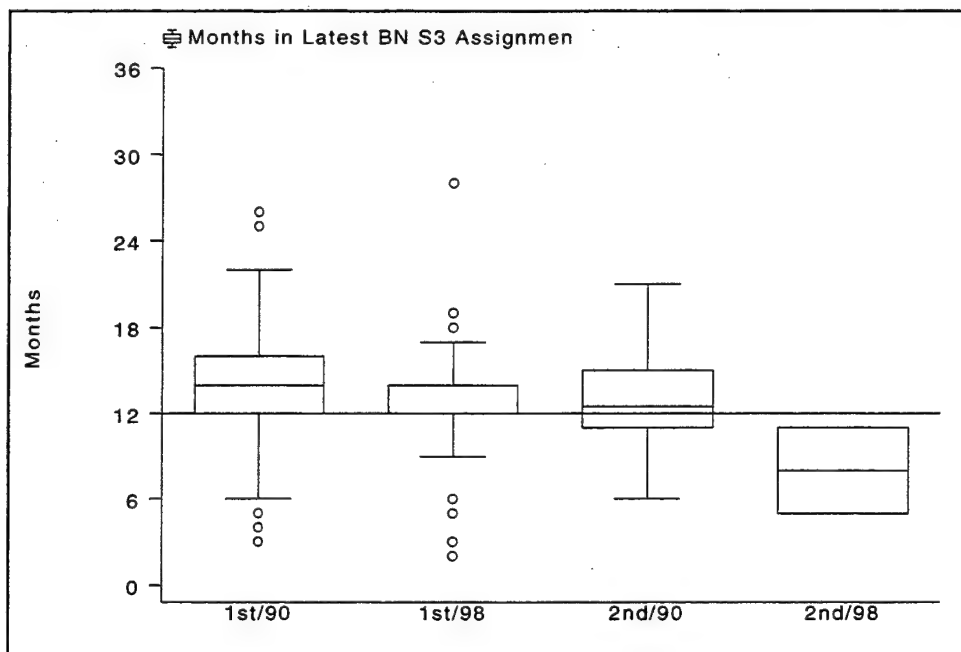
Battalion S3s

For Armor officers, the average length of an S3 assignment in an Armor or Infantry battalion declined by over ten percent between 1990 and 1998, from 13.8 to 12.3 months. This fall was evident for officers serving in their first branch-qualifying assignment (the average for this group was 13.9 months in 1990, but only 12.5 months in 1998), but even more strongly in the few who had previously served in another BQ position (13 months, on average, in 1990, compared to 8 months in 1998).

As with Infantry officers, the tour lengths for Armor officers serving as battalion S3s in their first branch-qualifying positions became much more uniform. As Figure B.9 indicates, the median fell from 14 months in 1990 to 12 months in 1998, and the distribution around this median became much more compact. The fifty percent of Majors in the second and third quartiles in 1990 served between 12 and 16 months in their S3 assignments; by 1998, the "ceiling" for this middle group dropped to 14 months. The shortest extremes were lower in 1998 than they had been in 1990, but, with the exception of one officer who served for 28 months, the longest assignments in 1998 were still not as long as they had been earlier. Overall, though the vast majority of first-time

battalion S3s in 1998 still exceeded the Army's 12-month minimum target, they had served less time in those jobs than had most of their counterparts in 1990. Further, this target appeared to become more of a maximum as well as a minimum, as officers had fewer opportunities to serve much longer than one year in the later 1990s.

Figure B.9: Distribution of Battalion S3 Assignment Lengths (AR Officers)



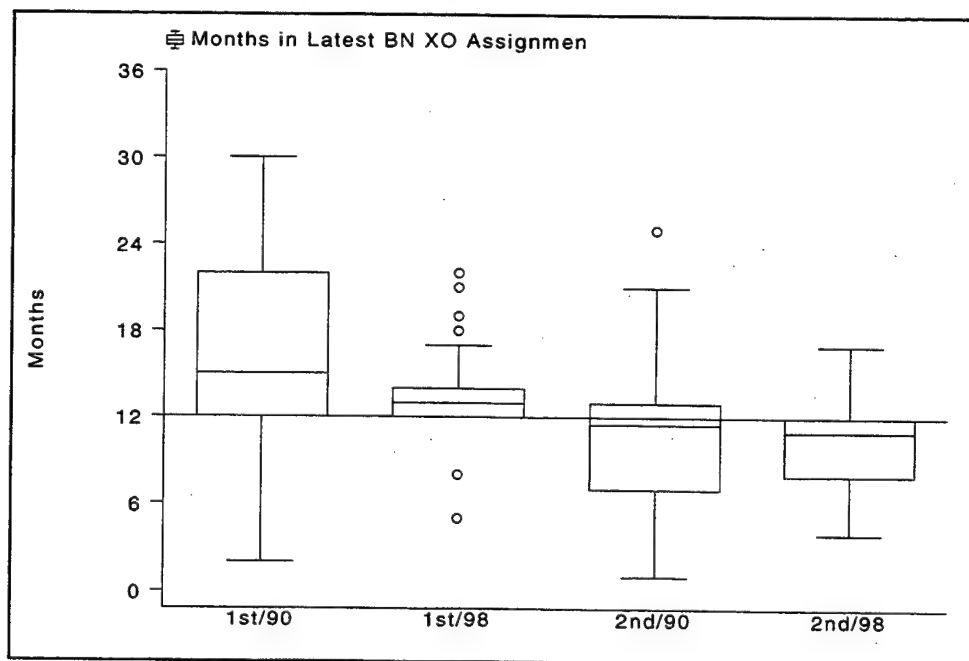
Very few battalion S3s had previously served in another branch-qualifying assignment (12.5 percent (six officers) in 1990, and 5.6 percent (two officers) in 1998). The median in 1990 was 12.5 months (individual assignments ranged from between six and 21 months); this dropped to eight months in 1998 (one officer served for five months, the other for 11) by 1998. Overall, it appears that almost all Armor officers had only one opportunity to serve as a battalion S3 (especially in the later 1990s). For those who did serve but once, it became more likely that these assignments would last just about 12 months, while opportunities for repeat BQ assignments as battlion S3s decreased over the course of the decade.

Battalion XOs

There was a small (two week, or four percent) decline in the average length of battalion XO assignments for Armor officers over the 1990s, to 13.0 months by 1998. This overall average, however, obscures significant declines for officers who were serving in their first branch-qualifying assignments: for this group, the average length of their XO assignment dropped from 16.1 months in 1990 to 13.5 months in 1998, a 16 percent decrease. XOs who had already held at least one other BQ position also held their positions longer in 1990 than they did in 1998 (11.2 vs. 10.7 months), but this was only a four percent decline.

Consistent with the falls in mean assignment length for Majors in their first BQ positions as battalion XOs, Figure B.10 shows that the median also fell between 1990 and 1998 from 15 to 13 months. The variance in assignment length also decreased for this group: while 75 percent of outgoing XOs in both years had served at least 12 months in their positions, the range for the third quartile (those whose

Figure B.10: Distribution of Battalion XO Assignment Lengths (AR Officers)



assignments were longer than half of all outgoing XO's but shorter than the longest 25 percent) shortened from between 15 and 22 months in 1990 to between 13 and 14 months in 1998. Thus half of all outgoing XO's in 1990 had served more time in their XO assignments than had three-quarters of all departing battalion XO's in 1998.

As with most assignments, officers who were serving in their second (or more) position of the same type spent less time in those jobs than did first-time position holders. In this group, the declines were less severe: the median for battalion XO's with prior BQ experience fell just two weeks from 1990 to 1998, to 11 months. The first quartile (officers whose assignments were shorter than 75 percent of all other exiting XO's in each year) fared better in 1998 than they had in 1990, serving between four and eight months at the end of the decade vs. between one and seven months at the beginning. At the same time, the top fifty percent in 1990 served longer in their XO positions (between 11.5 and 25 months) than did the same group in 1998 (between 11 and 17 months), so there was some decline in the opportunity to serve long periods of time in battalion XO jobs for the "most fortunate."

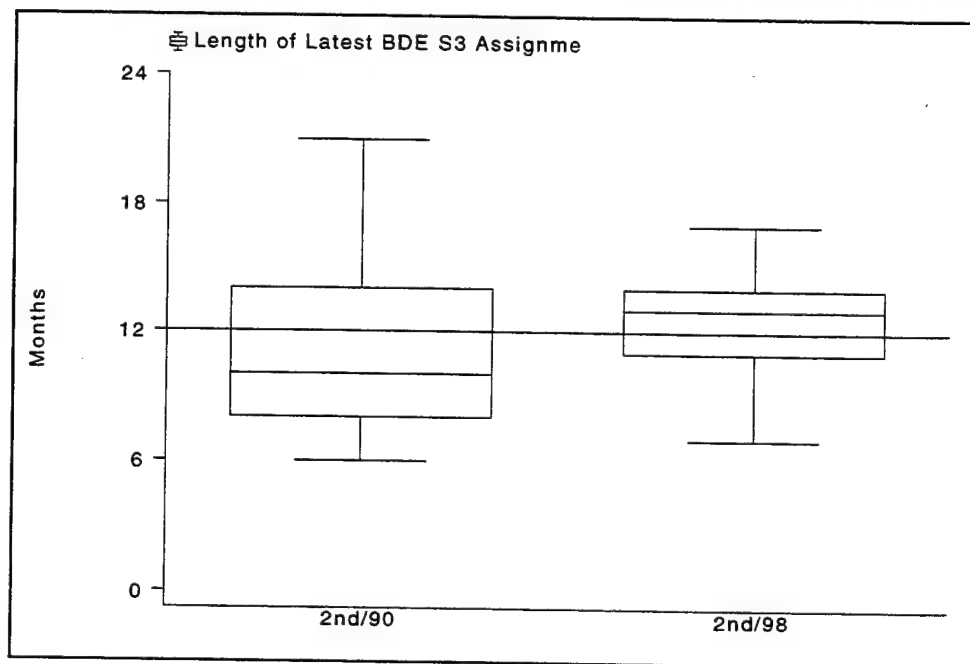
Brigade S3s

Armor officers who left a brigade S3 position in 1998 averaged slightly longer in that job than had similar officers in 1990 (11.7 vs. 11.5 months, respectively). Further distinction between those who were serving in their first BQ position and those with prior BQ experience reveals that the average assignment length decreased for the former group (nine months in 1990 vs. 8.5 months in 1998) but increased for the latter (11.8 months in 1990 vs. 12.5 months in 1998).

Figure B.11 shows the distribution of the length of brigade S3 assignments for those with at least one earlier BQ assignment. (There were only two brigade S3s in both 1990 and 1998 who did not fall into this group, so they are not depicted in the plots below.) The two officers in their first-time BQ positions in 1990 served for four and 14 months, while the two in 1998 served for five and 12 months; because there are so few officers in each year, it is difficult to identify any clear trends for brigade S3s in their first BQ jobs.

For those brigade S3s who had held at least one other BQ assignment, however, the distribution of assignment length did become tighter over the 1990s. Half of all outgoing brigade S3s in 1990 served between six and ten months, with the second quartile holding S3 positions for between eight and ten months. By 1998, fifty percent of exiting brigade S3s had spent between seven and 13 months in the position, with the second quartile serving between 11 and 13 months. Thus those officers in the middle fifty percent with the shortest assignments still served longer in 1998 than they had in 1990.

Figure B.11: Distribution of Brigade S3 Assignment Lengths (AR Officers)

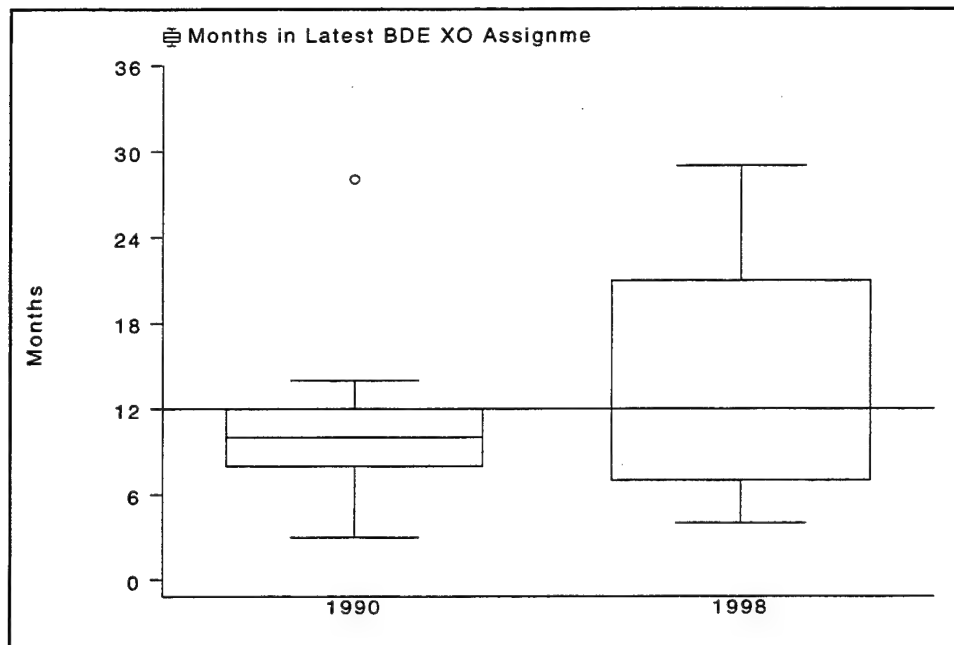


Brigade XOs

As was the case with Infantry officers leaving brigade XO positions, with one exception all Armor officers exiting XO assignments had previously held at least one other BQ position. There was a large increase -- almost 35 percent -- in the average length of these assignments, from 10.7 months in 1990 to 14.4 months in 1998. As Figure X.16 illustrates, this increase appears to be driven by a larger number of very long assignments in the late 1990s. Half of all outgoing XOs

served for ten months or less in 1990, compared to 12 months in 1998. But the largest difference is evident above the median: while only 25 percent (N=3) of exiting XOs held their jobs for more than 12 months in 1990, this was true for half of all outgoing XOs in 1998 (N=5).

Figure B.12: Distribution of Brigade XO Assignment Lengths (AR Officers)



Battalion and Brigade Commanders

As with Infantry officers, the length of field-grade commands was fairly consistent at about two years, although there was greater variation for repeat battalion commanders. Armor officers departing command of an Armor or Infantry battalion in 1998 had on average served seven percent longer than had their counterparts in 1990: the mean command tours were 24.6 and 22.8 months, respectively. Of these, most were leaving their first battalion command (39 of 46 in 1990 (85 percent) and 14 of 15 in 1998 (93 percent)). The mean assignment length for first-time commanders increased by five percent, from 23.7 months in 1990 to 24.8 months in 1998. For those leaving a second command, the seven officers in this group in 1990 averaged 17.6 months in position, compared to the 22-month command for the one repeat commander in 1998. For exiting brigade commanders, the average length of those positions

increased by four percent between 1990 and 1998, from 23.6 to 24.6 months (none had previously commanded another brigade).

C. DATA COLLECTION FORM

This appendix provides a brief explanation of the intent behind our decisions about what to include in our data collection form, which is followed by an example of the form itself. The data collection form was designed to capture information about the training content of officers' current and past assignments. It included ten different kinds of formal training events, as well as three types of time spent in "other" (informal) training at platoon, company, and battalion and brigade level. These events were identified through reviews of Army training doctrine and in discussions with training experts both in the Army and at RAND, and were intended to encompass all possible training activities. The positions we asked about included command assignments (company, battalion, and brigade), battalion and brigade S3 and XO positions, and two "catch-all" categories for all other battalion and brigade staff positions.

We did not include assignments at Division or above, nor those in TDA units. This is in part because we wanted to limit the number of categories for respondents. It was also based on the assumption that these other assignments were less likely to involve much hands-on training, so that our categories would allow us to capture the majority of the opportunities for tactical OJT. As for TOE assignments to Division and Corps staffs, these assignments do involve participation in some training events, and many include planning and coordination of training events and resources. While these assignments are useful in many ways, we determined that they were not likely to involve as many opportunities to apply tactical skills, which was our principal interest.

1. FIELD TRAINING

The rows of this chart represent positions you may have held. The columns represent specific training events that may have occurred during your tenure in that position.

- (a) For TOE **Assignments** in each of the selected positions estimate the total number of months you spent in the position (aggregating any multiple assignments, say, as a platoon leader, or in other principal staff jobs). Please write in the positions for other BN or BDE staff assignments. Do not include time in an acting capacity. For assignments you have never held, enter "0".
- (b) For the positions you held and the **Field Training Events** listed, estimate the total number of weeks you spent engaged in each training event while you held the designated position. Include time spent in ramp-ups or preparatory events. If an event did not occur during the time you held the position or is not applicable to the position, enter "N/A." If the event occurred but you did not participate, enter "0."

ASSIGNMENTS (In TOE Units)		FIELD TRAINING EVENTS (Total time spent -- in weeks)												
POSITION	Time in position (In Months)	Table VIII/XII OR LFX DISMTS	PLT Level FTX	Other PLT Level Field Tng	CO Level FTX	CO Level CALFEX	Other CO Level Field Tng	BN/BDE Level FCX	BN/BDE Level FTX	Other BN/BDE Level Field Tng	OPFOR (Other than at CTC)	O/C (Other than at CTC)	CTC	CTC OPFOR
CO CDR														
BN S-3														
BN XO														
Other BN Staff ()														
BN CDR														
BDE S-3														
BDE XO														
Other BDE Staff ()														
BDE CDR														

Please indicate: The total number of CTC rotations during your career _____. Number as OPFOR _____.

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2. SIMULATION

For each position you have held, estimate the total number of weeks you spent receiving training using each simulation. Where a training event involved multiple simulations, please record it only once in the column that best represents your participation.

ASSIGNMENTS	SIMULATION EVENTS (Time in weeks)								
POSITION	SIMNET	JANUS	ARTBASS	BBS	DIV BCTP	CORPS BCTP	OTHER Type	Time (wks)	
CO CDR									
BN S-3									
BN XO									
Other BN Staff (_____)									
BN CDR									
BDE S-3									
BDE XO									
Other BDE Staff (_____)									
BDE CDR									

3. DEPLOYMENTS

Please list the deployments that you have participated in throughout your career, including (a) the location or purpose of the deployment (e.g., Cobra Gold, Desert Storm, Reforger, etc. Please do not include deployments to habitually-used training areas such as Yakima, Pinon Canyon, or Grafenwoehr, as these should be included on the Field Training Events page); (b) the position you were assigned to at the time; (c) the length of the deployment, in weeks; (d) whether the deployment was with your unit or as an individual tasking; and (e) whether the deployment contributed to the development of your warfighting skills. If you need additional space, continue on the reverse side of this page.

[illegible]

D. SAMPLE DESIGN, STRUCTURE, AND REGRESSION ANALYSIS

This appendix expands upon the information provided in Chapter 4 about the primary data we collected on the content of assignments, and the design and results of our analysis. The first section discusses the data themselves, including our analysis design and response patterns, as well as potential sources of bias. The second section provides additional detail about the structure of our regression models, and gives a more detailed presentation of our results, followed by a series of graphs illustrating our basic findings.

DESCRIPTION OF DATA

Analysis Design

Our approach to assessing assignment content had two characteristics in particular that may affect the interpretation of our findings. The first was our unit of measure. In all of our regression models, our primary variable of interest was the total amount of time spent engaged in various categories of training and deployment events, which was intended to approximate developmental opportunities. One drawback to this metric of "time spent" is that it does not include any qualitative dimension. It is entirely possible, for example, that an officer could learn more about tactics in a well-designed field exercise lasting one week than he could in a poorly planned three-week-long event. In fact, many officers we interviewed stated their belief that the Army as a whole has become much more efficient and effective in its training, and that the quality of training events is generally higher than it has been, particularly in the more distant past. Thus less time spent training does not necessarily imply lower levels of tactical development. On the other hand, nor do high training levels necessarily equate to greater developmental opportunity: some units, we were told in our interviews, were engaging in so many training events back-to-back that preparation, review, and retraining to incorporate lessons learned were in some cases falling by the wayside.

We determined that developing an objective metric to fairly capture the quality of training and deployment events was beyond the

scope of this effort. We therefore decided that time spent, though imperfect, was the best available approximation of opportunity. Judgments about the implications of declines in time spent should, however, take beliefs about potential changes in the quality of training into account: it may be, for example, that decreases in training time were small enough that perceived improvements in training quality would be able to compensate. While acknowledging these concerns, we believed that there was value in providing a temporal comparison of the time spent on various activities, in order to provide at least some empirical benchmark from which to evaluate the concerns being expressed by field commanders.

A potentially more serious limitation of our design is that the absence of alternative sources of information forced us to rely on officers' recollections about what they had done much earlier in their careers, which in some cases had been up to eight years previously (for assignments that began in 1990). It is not clear whether officers were more likely to over- or under-estimate their actual experiences in retrospect. Though a review of the relevant literature did not produce evidence that memories of historical events are subject to a systematic bias (e.g., embellished or diminished recollections of the past), it is possible that nostalgia for the "good old days" prompted the officers we surveyed to inflate their recollections of the amount of training they had done earlier in the decade.¹ But it is also possible that they were less likely to remember the full range of training events in which they had actually participated, and thus that they would have "under-reported" true training levels.²

¹ Some analysis suggests that attitudes may affect autobiographical recall (Lydon et. al., 1988). If officers are assumed to generally feel positively towards combat training, for example, their recall of time spent in field exercises might be upwardly biased (and vice versa, in this case, if exercises such as simulation are perceived negatively). While this might bias the overall levels of activity reported, there is no evidence to indicate that this bias might become more extreme over time. That is, this finding implies that overall levels of field training time might be higher than what actually occurred, but that this would be true over the entire time period studied; this would not, therefore, explain any significant trends within a given type of activity.

² Research does indicate, however, that people (and especially those with significant experience in a given domain such as the older

As was mentioned in Chapter 4, we attempted to minimize the occurrence of distorted recall both in the design of our data collection form (i.e., by requesting information about very specific events and by "grounding" respondents in recent assignments first) and in our administration of the form. We expected that sending the forms in advance of our unit visits would allow officers to access any personal records and/or other data sources (e.g., spouses) to improve the quality of their responses. Further, by conducting in-person interviews with as many of the respondents as possible, we hoped to decrease the possibility of casual or perfunctory responses. Indeed, in observing the reasoning processes officers used to estimate their activities in the (in some cases distant) past, they tended to have clear memories of the number of times most events occurred (sometimes by making comparisons to current activity levels), and they then associated some typical duration with the frequency of those events. While informal, this reinforced our belief that the events included in the data collection form were salient and significant, and tended to be easy for officers to retrieve with high degrees of confidence. Thus although the problems with the validity of self-reporting are a drawback in any data collection effort that relies on individual recall, we ultimately determined there was no reasonable alternative or work-around, and took numerous steps to minimize potential bias and distortion.

Sampling Frame and Resulting Data

Beyond the caveats above, the set of officers from whom we sought information, as well as our resulting response rates, also has an impact on the interpretation of our results. The primary determinant of our overall sampling strategy was our decision to capture the current experiences of officers serving in key developmental positions in Infantry and Armor units, who were the primary source of the developmental concerns expressed in our interviews. For fiscal and

officers we surveyed) are more likely to remember events or information that was relevant to lines of reasoning used during problem solving (Hassebrock, et. al., 1993). This suggests that officers may have been more likely to accurately recall training events, particularly those that made meaningful contributions to the officer's tactical skills, even if the events had been much earlier.

logistical reasons, we limited ourselves to officers in units in the continental United States (CONUS). We were later able to supplement this group with officers attending the battalion and brigade Pre-Command Courses (PCCs) at Forts Benning and Knox.

Our sampling frame was thus defined as all commanders, XO's, and S3s serving in an Infantry or Armor brigade or battalion in CONUS, as well as one company commander from each battalion. These units were stationed at ten separate locations across the United States. Table D.1 depicts the numbers and locations of the units from which the officers we sampled were drawn.

Table D.1: Units Included in Sampling Frame, by Installation

Installation	IN BDEs	AR BDEs	IN BNs	AR BNs	TOT (BDE/ BN)
Fort Benning, GA	1		2	1	1/3
Fort Bragg, NC	3		9		3/9
Fort Campbell, KY	3		9		3/9
Fort Carson, CO	1	1	2	4	2/6
Fort Drum, NY	2		6		2/6
Fort Hood, TX	1	4	6	9	5/15
Fort Lewis, WA	1	1	4	2	2/6
Fort Polk, LA		1		3	1/3
Fort Riley, KS		2	2	4	2/6
Fort Stewart, GA	1	1	3	3	2/6
TOTAL	13	10	43	26	23/69

We requested data from the officers serving in key positions in each of these units. Table D.2 describes this population, and the number of officers in each group whom we successfully collected data. The top half of the table shows this information for Infantry units; Armor units appear below. Totals are listed in the last column and row of each section. Overall totals for both Infantry and Armor are included in the table's last row.

Table D.2: Responses By Unit Branch, Post and Position Type^a

IN								
	BDE CDR	BDE XO	BDE S3	BN CDR	BN XO	BN S3	CO CDR	TOTAL
Benning	1/1	1/1	1/1	2/1	2/2	2/2	2/2	11/10
Bragg	3/1	3/2	3/2	9/5	9/4	9/5	9/6	45/25
Campbell	3/1	3/3	3/3	9/9	9/7	9/7	9/10	45/40
Carson	1/0	1/1	1/0	2/1	2/1	2/2	2/2	11/7
Drum	2/1	2/2	2/2	6/5	6/5	6/5	6/4	30/24
Hood	1/0	1/0	1/0	6/0	6/0	6/0	6/0	27/0
Lewis	1/1	1/1	1/1	4/4	4/4	4/3	4/5	19/19
Polk								
Riley				2/1	2/0	2/1	2/0	8/2
Stewart	1/0	1/1	1/1	3/1	3/2	3/2	3/1	15/8
TOT IN	13/5	13/11	13/10	43/28	43/26	43/27	43/30	211/137

AR								
	BDE CDR	BDE XO	BDE S3	BN CDR	BN XO	BN S3	CO CDR	TOTAL
Benning				1/1	1/1	1/0	1/1	4/3
Bragg								
Campbell								
Carson	1/1	1/1	1/1	4/2	4/2	4/3	4/4	19/14
Drum								
Hood	4/0	4/1	4/1	9/2	9/3	9/0	9/0	48/7
Lewis	1/1	1/1	1/1	2/2	2/2	2/1	2/2	11/10
Polk	1/1	1/1	1/1	3/3	3/2	3/2	3/3	15/13
Riley	2/0	2/1	2/0	4/4	4/2	4/2	4/0	22/9
Stewart	1/1	1/1	1/1	3/2	3/2	3/2	3/1	15/10
TOT AR	10/4	10/6	10/5	26/15	26/14	26/11	26/11	134/66

TOTAL	23/9	23/17	23/15	69/43	69/40	69/38	69/41	345/203
-------	------	-------	-------	-------	-------	-------	-------	---------

^aThe first number in each cell is the total population of officers serving in the assignment type and unit that were stationed at the location listed in each row. The second is the number of officers in this group who completed a data collection form. (Blank cells indicate that no units of that echelon and branch were stationed at the relevant post.)

As these numbers indicate, our overall response rate was about 60 percent. The implications of these response patterns are only likely to relate to our data in 1997 and 1998, however, because data for assignments prior to that time related to other position types (usually) in other locations. Perhaps the most important implication the response rates shown above was the low level of participation at Fort Hood. We were not able to collect any data from the Infantry brigade of the 4th Infantry Division that is stationed there. This fact, however, may not have had a major impact on our ability to characterize the basic training patterns of "normal" Infantry units, because this brigade

(along with another Armor brigade from the same division) is engaged in experimentation with digital equipment and technologies. The degree to which its training patterns thus diverge from those in more typical brigades is not known, but the exclusion of data from this unit is not expected to have had a major impact on the representativeness of our sample.

Perhaps more important was the fact that we were not able to collect data from any of the three Armor brigades of the 1st Cavalry Division also stationed Fort Hood, as they were engaged in preparation for a deployment to Bosnia. It may be that these units were engaged in significantly more training as part of this preparation; if so, including data from officers in those units would probably have raised the mean values for training in 1997 and 1998, and perhaps resulted in weaker support for our hypotheses than we report here. It is also possible, however, that the training levels for these units did not, on average, differ significantly from other Armor brigades during the same time period. There is at least one reason to expect that this might be the case. We were repeatedly told in interviews (conducted both for this study and for the larger TEMPO study of which this effort is a part) that access to training space at Fort Hood was limited, and that competition for ranges among the five brigades permanently stationed there was intense. Thus it may be that the *focus* of the training for the units expecting to deploy changed during the preparation phase rather than increased, because the potential for large amounts of additional training was limited. If this is the case, then low response rates from these brigades should not have had a major effect on our results.

As alluded to above, another implication of our overall design was that our data were somewhat geographically skewed over time. Because the overwhelming majority of the officers in our sample were currently serving in CONUS assignments, our information in 1997 and 1998 applies to CONUS positions only. But because we also asked officers about all of their previous assignments in warfighting brigades, and they had served those assignments not only in CONUS but also in other theaters, data for earlier assignments was geographically varied. This inconsistency precluded us from being able to make geographic

comparisons over time, although our regression models did take assignment location into account.

It is also possible that our design could have introduced some selection bias. The data from historical assignments came from those officers who have both continued to be promoted and have chosen to remain in the Army. Either or both of these factors could mean that they were more likely to have had higher levels of tactical exposure in their prior assignments than their peers; such "non-representativeness" would lead to bias in our results.

First, the Army has continued to promote the older officers that we surveyed, a process that becomes increasingly selective at each grade. If those who are more likely to have higher levels of tactical exposure were also more likely to be promoted, data from older assignments would be upwardly biased. There is some reason to believe this may in fact be the case, although this effect may not be as large as initially expected. The information available to promotion boards includes a history of assignments, and the evaluations of superior officers. There is likely to be some association between tactical exposure and the units to which an officer is assigned; units that are slated to deploy earlier to real-world operations typically train (or are believed to train) at higher rates than later-deploying units, so that an officer who has served in such organizations might be expected to have had more exposure to training events than an officer who was assigned elsewhere. However, discussions with officers who have served on such boards suggest that the subjective assessments of senior officers hold more weight than do assignments to specific units, and that these evaluations tend to focus more heavily on how the officer responded to the opportunities afforded him than the quality or quantity (above a reasonable minimum) of those opportunities themselves. If this is true, this implies that individual characteristics and abilities are more likely to be responsible for continued promotion than are the levels of training exposure, and thus the data would not be heavily influenced upwards merely because an officer has advanced.

This is not the case, however, in the case of deployments; promotion boards are typically aware of whether an officer has participated in a real-world operation, which many believe increases the

chance of promotion (all else being equal). Thus it seems reasonable to expect that the more senior officers we surveyed may have been more likely than the average officer in their cohort to have spent more time deployed, though the degree of this bias is not clear.

Another and perhaps more serious problem is that officers with higher-than-average levels of tactical exposure may have "self-selected" through their decision to remain in the Army, while those with lower levels chose to pursue other opportunities either in the non-warfighting parts of the Army or in the civilian world. Many officers we spoke with cited opportunities for tactical training as a major, if not the primary, motivation for joining the Army. Assuming that this sentiment is fairly widespread, it is possible that people who did not feel they were getting enough opportunities to practice their craft chose to remove themselves from the competition for higher levels of command, and thus from our sample population. Conversely, it may be that too much training might have driven some people from the force; we certainly spoke with officers who cited the fast pace of operations as a strain on their families and personal lives, including some who stated that they loved their jobs but that they needed greater predictability and stability and were thus choosing to depart. The reality, then, may be that there is some "band" of acceptable levels of training, within which training is frequent enough to be professionally satisfying but that still allows enough time for other priorities. If this is the case, then those officers that remain in the force (and thus who were a part of the population from which we drew our sample) would represent a middle range of exposure to training: not necessarily those who had experienced the highest levels, nor the lowest.

When administering the data collection form, our general practice was to also request an interview with each officer. We mailed the forms a few weeks in advance of our visit, which were distributed to the relevant officers within the unit and were to be completed prior to our arrival. We then reviewed the forms during individual interviews, and asked a series of questions about developmental opportunities. A few units were unable to accommodate our request for personal visits because of other commitments, but most participated by submitting data collection forms by mail. There were some cases in which an officer

filling one of the positions of interest was not available during our visit to the unit, or (in rare instances) a key position was vacant. In the first instance, we asked that the unavailable officer complete the data collection form and return it by mail. When the data form was submitted by mail, we tried (and in most cases succeeded) to conduct phone interviews to supplement our analysis. Ultimately we conducted interviews with 192 different officers in our sampling frame. This represented 56 percent of the entire population, and over 80 percent of those from whom we successfully collected data.

From this unit sampling strategy, our initial data set included information about 575 assignments that began between 1990 and 1998,³ that had been held by 226 different officers (148 Infantry and 78 Armor) (each assignment was one observation). These data included 99 "problem" cases that were ultimately omitted from our analysis. Observations were excluded for at least one of three reasons: the first was if that the officer had served in an assignment for less than three months. We excluded these cases because our unit interviews gave us reason to believe that officers who had only been in position for short periods of time typically had not been fully integrated into the unit training cycle, and thus might not provide representative information about the true levels of training their assignments might eventually involve, on the whole. Almost all of these "short length" cases were in 1997 and 1998, which was a function of when we collected our data.

The second reason for which assignment data was excluded was if an officer had held a position for more than three months, but had reported spending no time either deployed or engaged in home station training events. In most cases, these appeared to be instances where more senior officers did not or could not recall what they had done. Given the written and verbal comments we received, we determined that it was more likely that officers could not provide the actual information rather than that it was an accurate representation of events (i.e., that the

³ We also collected information about assignments during the 1980s; however, we did not include these data in our analysis. This was because we did not have enough information in each year to detect significant changes this far in the past.

assignment had not in fact involved any training or deployments), so we therefore decided to omit these cases as well.

Finally, there were 64 assignments for which the amount of time that officers reported having spent in training and/or deployed exceeded the total amount of time the officer had spent in the assignment, a practical impossibility.⁴ In cases when we were unable to reconcile such discrepancies with the officer himself, we did not include these assignments in the final analysis. It is expected that in fact these assignments were likely to have involved high levels of training and/or deployments, just not as much time as was actually reported. Because these types of 'infeasible' assignments made up the bulk of the removed data, and because they represented a larger proportion of the annual assignments at the beginning of the 1990s than at the end, it is expected that on average, the net bias from excluding data from these 99 assignments would be downward. That is, we expect that estimates of training and deployments are lower in the early 1990s than they would have been had we been able to obtain more accurate information about these assignments, and thus may under-represent true activity levels. Figure D.1 shows the number of observations that were excluded in each year and the reason, in relation to the total number of observations that were used, in both real and percentage terms. If in fact the net bias were downward as we hypothesize, this would mean that in general, our analysis would result in weaker support for hypotheses about declines in unit training.

After omitting these 99 cases, our final data set included data from 220 different officers (146 Infantry and 74 Armor) about the 476 assignments (316 for Infantry officers and 160 for Armor officers) that they held had held in warfighting brigades between 1990 and 1998.⁵

⁴ It is in fact possible (and in many cases probable) that deployments also involved training, in which case the time would be "double counted" as both deployed and as engaged in a training event. We tried to make clear to respondents that training during a deployment should not be included in the section of the form that asked about home station training events, and that this time should instead be reflected in the section on deployments. In some cases, particularly when forms were completed without the benefit of an individual interview, this intent may not have been fully understood.

⁵ We also collected information about assignments during the 1980s; however, we did not include these data in our analysis. This was

Figure D.1: Description of Utilized/Excluded Observations

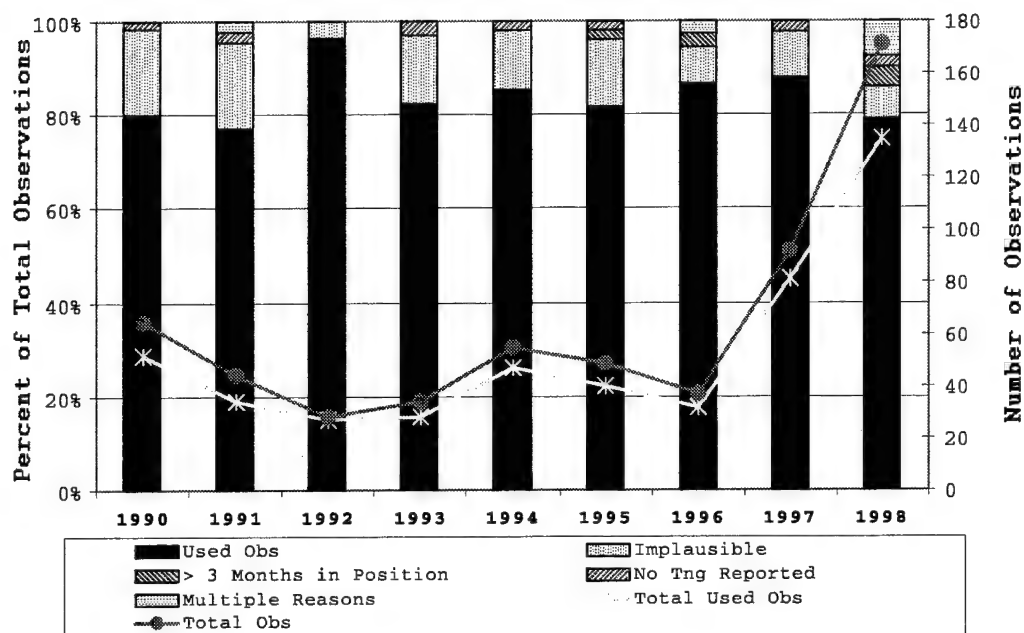


Table D.3 summarizes the number of assignments, by branch, position type, and year, that we used in our analysis. (Again, each assignment is one observation.)

Table D.3: Number and Type of Assignment Observations, 1990-1998

	1990		1991		1992		1993		1994		1995		1996		1997		1998		TOTAL	
	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR	IN	AR
CO CDR	21	7	11	7	8	4	4	2	2	0	0	0	0	0	5	3	19	5	70	28
BN STF	4	5	6	2	2	1	1	0	5	2	7	3	3	0	6	3	1	0	35	16
BN S3	4	0	0	0	1	1	7	4	4	9	8	6	4	3	9	6	26	8	63	37
BN XO	0	1	2	0	1	2	3	0	6	2	3	4	3	3	5	5	22	6	45	23
BDE STF	5	3	1	3	3	0	0	0	3	0	0	0	4	1	12	4	3	1	31	12
BDE S3	0	0	1	0	1	0	1	3	5	2	6	3	4	2	1	1	6	4	25	15
BDE XO	1	0	0	0	0	0	0	2	2	1	0	0	1	2	3	3	9	3	16	11
BN CDR	0	1	1	0	1	2	1	0	2	2	0	0	1	1	8	4	12	6	26	16
BDE CDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1	5	2
TOTAL	35	17	22	12	17	10	17	11	29	18	24	16	20	12	51	30	101	34	316	160

Given our sample design, response patterns, and data cleaning efforts, it is probable that our results are biased in some way. However, many of the potential biases operate in opposite directions, precluding a reasonable determination of their net effect. Ultimately we cannot determine "ground truth," but given the constraints with which

because we did not have enough information in each year to detect significant changes this far in the past.

we were faced, we believe that the data we collected represent a valuable source of information about assignment content that exceeds the bounds of current knowledge, and that they serve as a basis for additional work that can hopefully improve upon our initial efforts.

MODEL DESIGN

As discussed in Chapter 4, we used 16 different regression models to estimate changes in assignment content. These models tested whether the amount of time that Infantry and Armor officers, respectively, spent in eight separate activities had changed over time. In each model, the length of time spent in the relevant training or deployment activity was the dependent variable. As was also discussed in Chapter 4, two different model variants were used: a "rates" model that tested for a linear trend over time, and a "levels" model that tested whether levels of time spent varied as a step function of time. Table D.4 below lists abbreviations and definitions for both the dependent and independent variables that were used in the 16 models.

Table D.4: Definition of Variables Used in Regression Models

Variable Abbreviation	Model ^a	Definition
DEPENDENT VARIABLES		
HS TOT	R, L	Weeks per assignment spent in home station training
SIM	R, L	Weeks per assignment spent in simulation training
LVFR	R, L	Weeks per assignment spent in live-fire training
MNVR	R, L	Weeks per assignment spent in maneuver training
PLT/CO	R, L	Weeks per assignment spent in PLT- or CO-level training
BN/BDE	R, L	Weeks per assignment spent in BN- or BDE-level training
OP DEP	R, L	Weeks per assignment spent in deployments other than to CTCs
CTC	R, L	Weeks per assignment spent deployed to CTCs
INDEPENDENT VARIABLES		
CONS	R	Constant term, represents company commanders whose assignments were in CONUS and began in 1990.
CONS	L	Constant term, represents company commanders whose assignments were in CONUS and began in 1990-91 for Infantry live-fire model, 1992-93 for Infantry non-CTC deployments model.
90s	R	Time trend variable ranging from 0 to 8 to represent a linear trend throughout the 1990s (0 for 1990, 1 for 1991, ...)
MID90s	L	Dummy variable that takes on the value 1 if the assignment began in 1992-96 for Infantry live-fire model, 1994-95 for Infantry non-CTC deployments model, 0 otherwise
END90s	L	Dummy variable which takes on the value 1 if the assignment began in 1997-98 for the Infantry live-fire model or 1996-98 for Infantry non-CTC deployments model, 0 otherwise
BN S3	R, L	Dummy variable which takes on the value 1 if the assignment was as a battalion S3, 0 otherwise
BN XO	R, L	Dummy variable which takes on the value 1 if the assignment was as a battalion XO, 0 otherwise
BN CDR	R, L	Dummy variable which takes on the value 1 if the assignment was as a battalion commander, 0 otherwise
BDE S3	R, L	Dummy variable which takes on the value 1 if the assignment was as a brigade S3, 0 otherwise
BDE XO	R, L	Dummy variable which takes on the value 1 if the assignment was as a brigade XO, 0 otherwise
BDE CDR	R, L	Dummy variable which takes on the value 1 if the assignment was as a brigade commander, 0 otherwise
BN STF	R, L	Dummy variable which takes on the value 1 if the assignment was to a BN staff (in other than an XO or S3 position), 0 otherwise
BDE STF	R, L	Dummy variable which takes on the value 1 if the assignment was to a BDE staff (other than as an XO or S3), 0 otherwise
AKHIPAN	R, L	Dummy variable which takes on the value 1 if the assignment was in Alaska, Hawaii, or Panama, 0 otherwise
EURSWA	R, L	Dummy variable which takes on the value 1 if the assignment was in Europe or Southwest Asia, 0 otherwise
KOREA	R, L	Dummy variable which takes on the value 1 if the assignment was in Korea, 0 otherwise
WIP	R, L	Number of weeks spent in the assignment

^a An "R" indicates the variable was included in the "rates" model, "L" indicates the variable was included in the "levels" model.

We first estimated each model using Ordinary Least Squares (OLS). Diagnostic tests of these regressions showed evidence of heteroskedasticity (non-constant variance in the error terms). A variety of other functional forms were tried in an effort to correct for this problem, but none resulted in clear improvements. Ultimately, we decided to use an alternative robust regression estimator, the White estimator.⁶ This technique corrects for the violation of the OLS assumption of constant variance in the error terms. It generally had the effect of widening our confidence intervals, decreasing the estimated precision of our estimates.

We also recognized the possibility that some officers may have systematically over- or under-estimated their participation in training and deployment events. This possibility would have caused correlation in the error terms, again a violation of OLS assumptions. To correct for this, we used an estimation technique that relaxes the assumption of independence between observations. This too had the effect of increasing the confidence intervals and reducing the precision of our estimates.⁷

Models for Infantry Officers

Reflecting these corrections, the model predictions for Infantry officers are shown in Table D.5 below. The eight models appear in the last eight columns of the table, with coefficients and their t-statistics in parentheses below. All variables are estimated in weeks.

⁶ White, among others, developed this estimator, and described its statistical properties (White, 1980; 1982).

⁷ This cluster option for the White estimator was developed by Rogers (Rogers, 1993).

Table D.5: Regression Model Estimates (IN Officers)

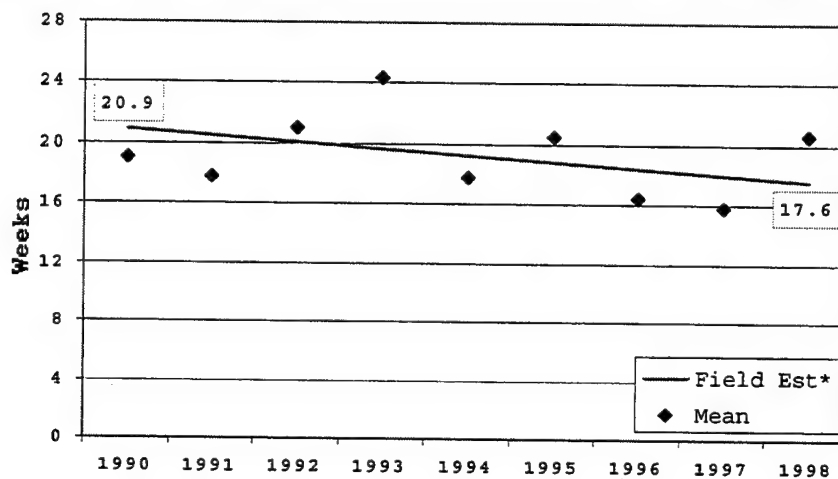
N=316									
Model/ Var	Sample Mean	HS TOT	SIM	LVFR	MNVR	PLT/CO	BN/BDE	OP DEP	CTC
CONS		15.90 (3.71)	-2.03 (-1.92)	2.62 (2.25)	12.64 (3.56)	14.52 (4.47)	1.10 (0.57)	-7.02 (-2.63)	-0.34 (-0.30)
90s		-0.41 (-1.28)	0.16 (1.96)		-0.48 (-1.79)	-0.38 (-1.52)	-0.08 (-0.44)		0.02 (0.21)
MID90s				2.24 (2.79)				4.92 (2.74)	
END90s				0.78 (-2.39)				1.84 (1.61)	
BN XO	0.14	-8.69 (-3.21)	0.47 (0.84)	-2.17 (0.99)	-6.46 (-2.92)	-10.70 (-5.00)	2.64 (1.96)	0.88 (0.73)	0.30 (0.53)
BN S3	0.19	-4.40 (-1.82)	1.47 (2.45)	0.30 (0.38)	-4.98 (-2.53)	-5.74 (-3.11)	1.66 (1.52)	0.58 (0.44)	0.13 (0.27)
BN CDR	0.08	-4.42 (-1.32)	2.59 (2.54)	0.04 (0.03)	-3.81 (-1.49)	-5.65 (-1.96)	2.18 (1.42)	-1.38 (-0.78)	0.65 (0.80)
BDE XO	0.05	-13.12 (-3.89)	0.85 (1.05)	-2.88 (-2.38)	-9.58 (-3.15)	-15.94 (-7.63)	3.80 (1.54)	1.71 (1.07)	0.73 (0.84)
BDE S3	0.08	-13.06 (-5.47)	3.42 (3.41)	-3.90 (-4.18)	-10.04 (-4.95)	-15.60 (-8.07)	2.71 (2.02)	-0.20 (-0.12)	0.95 (1.45)
BDE CDR	0.02	-6.14 (-1.07)	1.59 (1.00)	0.69 (0.38)	-7.88 (-1.83)	-10.57 (2.15)	3.45 (1.79)	-2.13 (-0.83)	0.70 (0.45)
BN STF	0.11	-15.71 (-5.26)	0.50 (0.67)	-3.89 (-4.46)	-11.87 (-4.81)	-15.61 (7.18)	0.48 (0.38)	1.01 (0.55)	-0.21 (-0.34)
BDE STF	0.1	-20.03 (-7.49)	0.91 (1.43)	-5.09 (7.38)	-14.93 (-6.47)	-19.45 (9.47)	-0.11 (-0.10)	-0.06 (-0.04)	1.34 (2.30)
AKHIPAN	0.07	-0.33 (-0.11)	0.02 (0.04)	4.23 (2.59)	1.05 (0.38)	1.54 (0.67)	-1.92 (-1.38)	-2.71 (-1.74)	-0.94 (-1.64)
KOREA	0.04	7.88 (2.61)	2.87 (1.82)	-2.14 (-3.19)	2.14 (1.08)	3.46 (1.16)	3.33 (1.65)	1.30 (0.96)	-2.45 (-5.58)
EURSWA	0.06	-1.70 (-0.44)	2.28 (1.53)	-0.02 (0.01)	0.67 (0.19)	1.27 (0.45)	-0.60 (-0.34)	8.90 (1.34)	1.60 (1.02)
WIP	58.7	0.24 (6.53)	0.05 (4.43)	0.17 (4.05)	0.19 (5.78)	0.13 (4.57)	0.11 (5.28)	0.13 (4.43)	0.04 (5.71)

The following figures illustrate the regression results, along with the underlying pattern of means from the survey data. Each figure shows the means⁸ (in diamonds), and the fitted regression line from the

⁸ In many of these graphs, the means in 1998 show an increase in types of field training (and in field training overall) relative to

linear ("rates") model. A solid line indicates statistically significant results, while a dashed line represents p-values greater than 0.10 (based on a one-sided test, as for each model we had expectations of either a positive (i.e., an increase) or negative (a decrease) change). The values of both the means and the regression estimates have been normalized to represent a 12-month assignment, for an average position at brigade level or below, at any location.

Figure D.2: Weeks Spent in Home Station Field Training (IN Officers)



1997. We do not know whether this represents an actual rise, or one that is due to potential sample bias, random variation, or some combination of the two. We know of no reason to expect that actual training levels were in fact higher in 1998 than they had been the year before; in fact, at least one source indicates that training, at least for the Army's heavy divisions, has continued to be well below what the Army budgets (Naylor, 6 December 1999: 10). Therefore, we do not believe that this "blip" in 1998 represents a reversal of many of the trends portrayed here, though we cannot be certain that this is the case.

Figure D.3: Weeks Spent in Simulation Training (IN Officers)

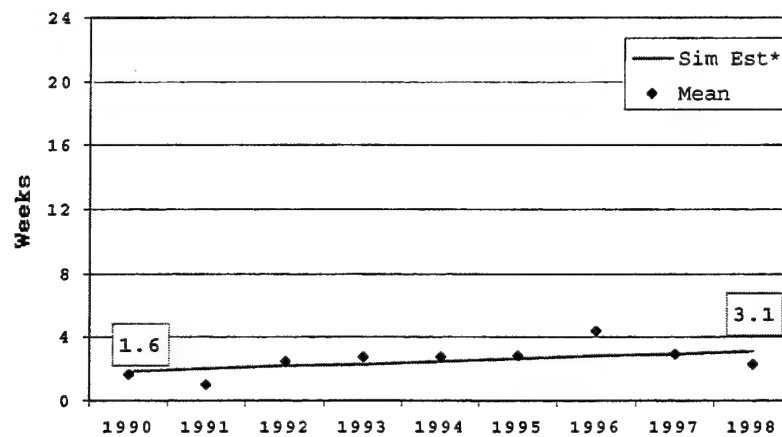


Figure D.4: Weeks Spent in Live-Fire Training (IN Officers)

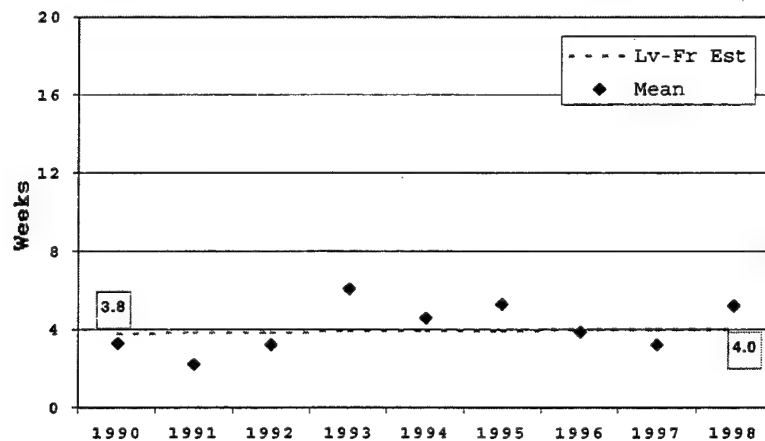


Figure D.5: Weeks Spent in Maneuver Training (IN Officers)

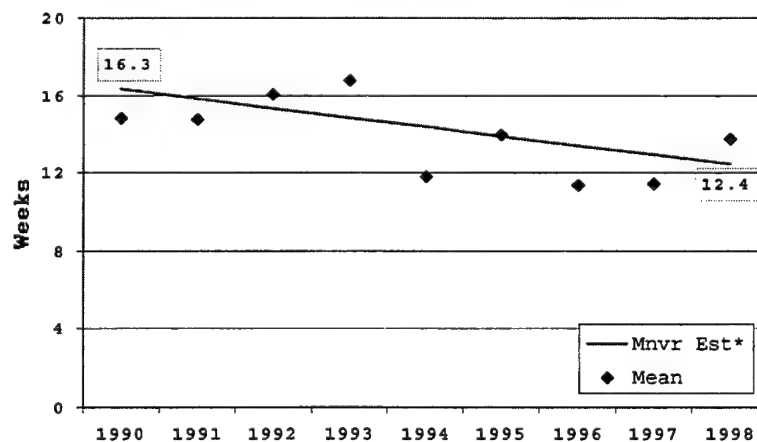


Figure D.6: Weeks Spent in PLT/CO-Level Training (IN Officers)

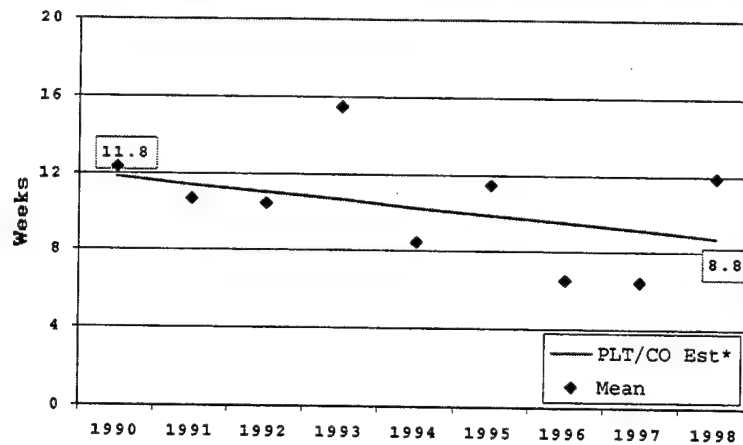


Figure D.7: Weeks Spent in BN/BDE-Level Training (IN Officers)

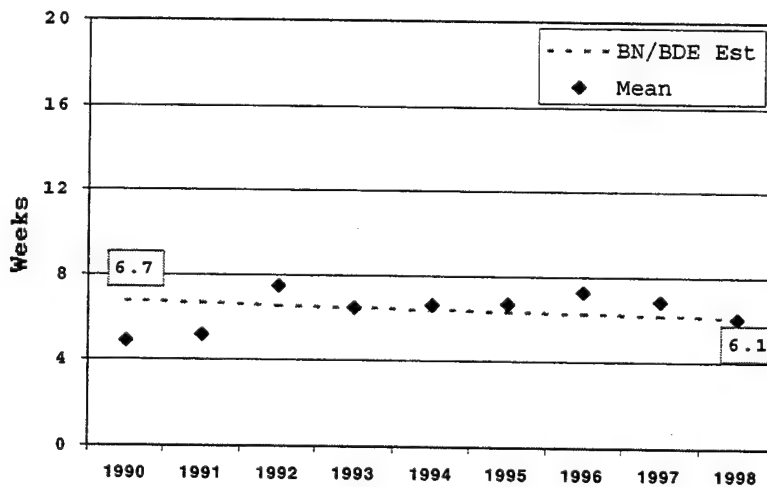


Figure D.8: Weeks Spent in Deployments Other than CTCs (IN Officers)

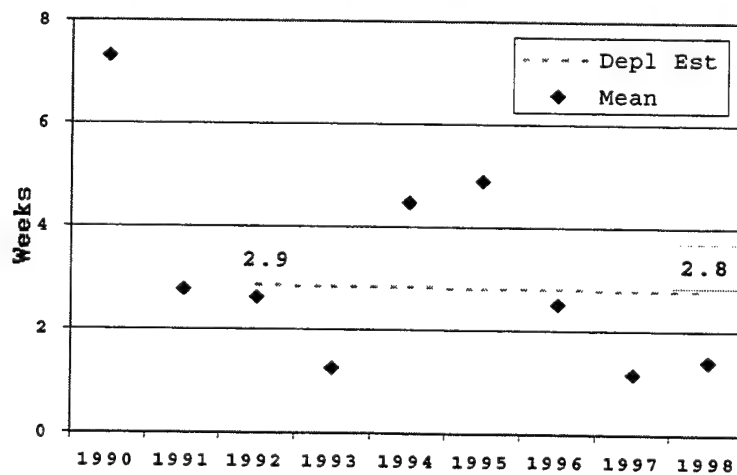
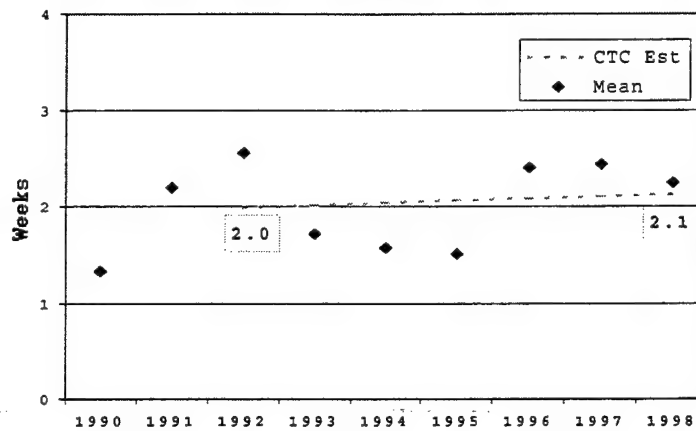


Figure D.9: Weeks Spent Deployed to CTCs (IN Officers)



Models for Armor Officers

Table D.6 shows the results of the eight regression models for Armor Officers. As with the earlier table for Infantry officers, the eight models appear in the last eight columns of the table, with coefficients and their t-statistics in parentheses underneath, and all variables are estimated in weeks.

Table D.6: Regression Model Estimates (AR Officers)

Model/ Var	Sample Mean	HS TOT	SIM	LVFR	MNVR	PLT/CO	BN/BDE	OP DEP	CTC
CONS		9.17 (1.49)	-0.89 (-0.29)	3.07 (1.58)	7.29 (1.35)	7.25 (1.53)	3.11 (0.86)	-14.66 (-1.87)	1.16 (0.78)
90s		-1.09 (-2.12)	0.09 (0.40)	-0.34 (-1.79)	-0.82 (-1.90)	-0.59 (-1.58)	-0.57 (-1.63)	1.06 (1.80)	-0.27 (-2.20)
BN XO	0.14	-4.35 (-1.13)	0.25 (0.17)	-0.40 (-0.31)	-5.44 (-1.54)	-6.21 (-2.29)	0.37 (0.13)	7.17 (1.75)	-0.09 (-0.09)
BN S3	0.23	2.48 (0.73)	2.13 (1.57)	2.33 (2.05)	-0.53 (-0.16)	1.17 (0.44)	0.62 (0.27)	3.46 (1.14)	0.90 (1.03)
BN CDR	0.1	1.78 (0.37)	1.52 (0.83)	3.78 (1.57)	-3.03 (-0.75)	2.09 (0.43)	-1.34 (-0.56)	2.64 (0.65)	0.63 (0.63)
BDE XO	0.07	-7.97 (-2.00)	3.11 (1.19)	-1.85 (0.98)	-7.40 (-2.16)	-11.37 (-3.57)	2.12 (0.86)	6.24 (1.39)	2.57 (1.92)
BDE S3	0.09	-2.90 (-0.64)	1.87 (0.78)	-0.39 (0.24)	-2.07 (-0.51)	-5.49 (-1.81)	3.03 (1.05)	3.92 (1.09)	-0.23 (-0.22)
BDE CDR	0.01	1.63 (0.33)	0.29 (0.07)	2.73 (2.76)	-2.71 (-0.47)	0.05 (0.02)	-0.02 (-0.01)	-1.81 (-0.62)	1.24 (0.81)
BN STF	0.1	-8.36 (-1.88)	-2.44 (-1.62)	-1.72 (-1.16)	-8.70 (-2.40)	-9.52 (-2.76)	-0.90 (-0.33)	4.60 (0.78)	-1.01 (-0.88)
BDE STF	0.08	-4.35 (-1.01)	1.33 (0.70)	-2.68 (-1.93)	-1.78 (-0.39)	-9.16 (-2.71)	4.70 (1.29)	6.67 (1.18)	-0.08 (-0.09)
KOREA	0.01	-3.17 (-1.00)	-1.33 (-0.59)	0.74 (0.66)	-4.66 (-1.30)	0.55 (0.22)	-4.46 (-2.49)	5.32 (1.69)	-4.71 (-2.34)
EURSWA	0.19	-4.74 (-1.90)	1.32 (0.85)	-0.72 (-0.83)	-3.97 (-1.44)	-2.38 (-1.25)	-2.30 (-1.36)	-9.31 (-2.11)	0.50 (0.65)
WIP	61.4	0.30 (6.52)	0.07 (2.50)	0.07 (4.14)	0.23 (5.20)	0.20 (4.97)	0.10 (3.46)	0.16 (2.55)	0.04 (4.22)

The following figures display these results graphically, again normalized for an average 12-month assignment in a warfighting brigade.

Figure D.10: Weeks Spent in Home Station Field Training (AR Officers)

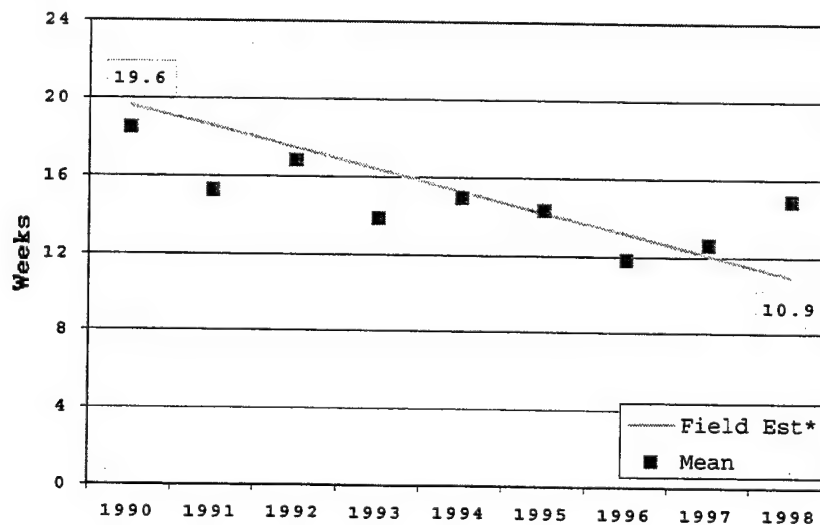


Figure D.11: Weeks Spent in Simulation Training (AR Officers)

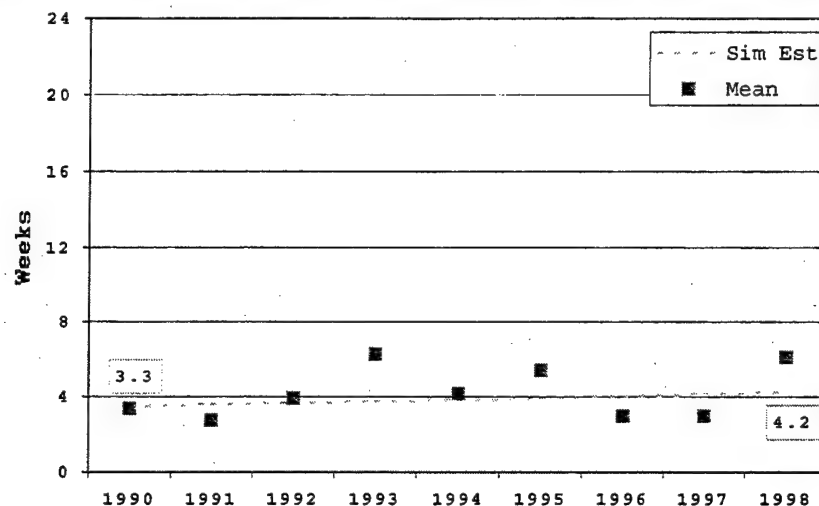


Figure D.12: Weeks Spent in Live-Fire Training (AR Officers)

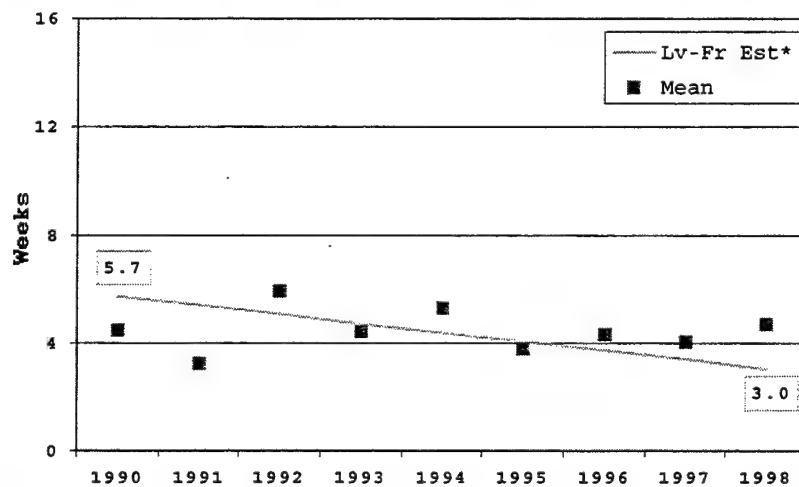


Figure D.13: Weeks Spent in Maneuver Training (AR Officers)

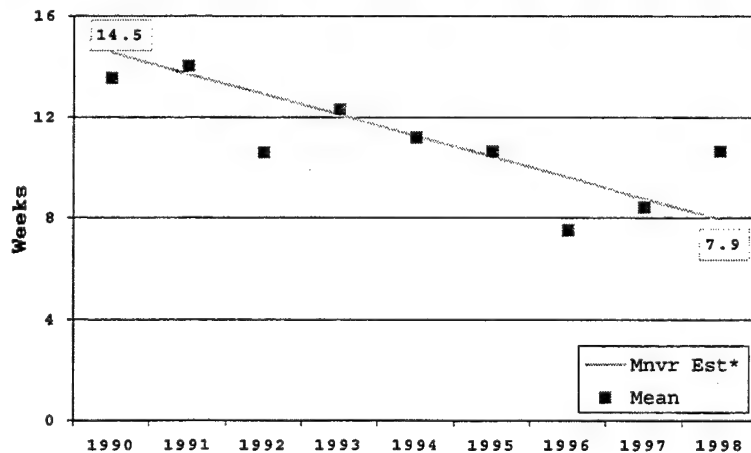


Figure D.14: Weeks Spent in PLT/CO-Level Training (AR Officers)

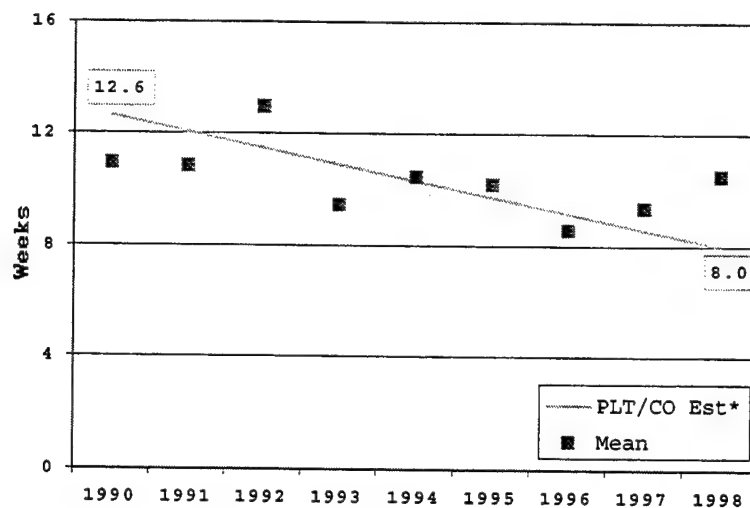


Figure D.15: Weeks Spent in BN/BDE-Level Training (AR Officers)

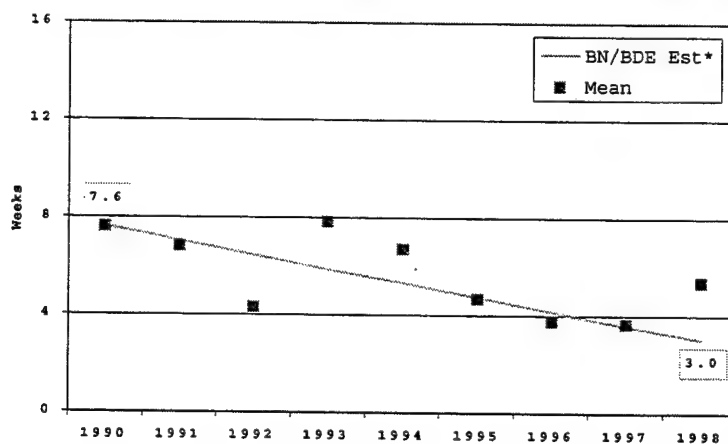


Figure D.16: Weeks Spent in Deployments Other than CTCs (AR Officers)

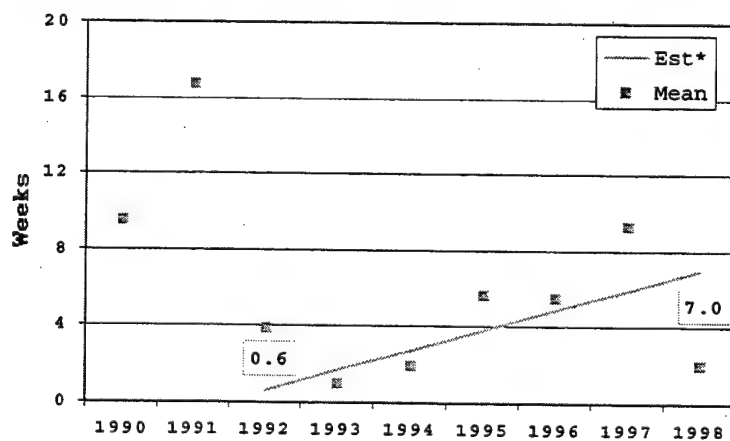
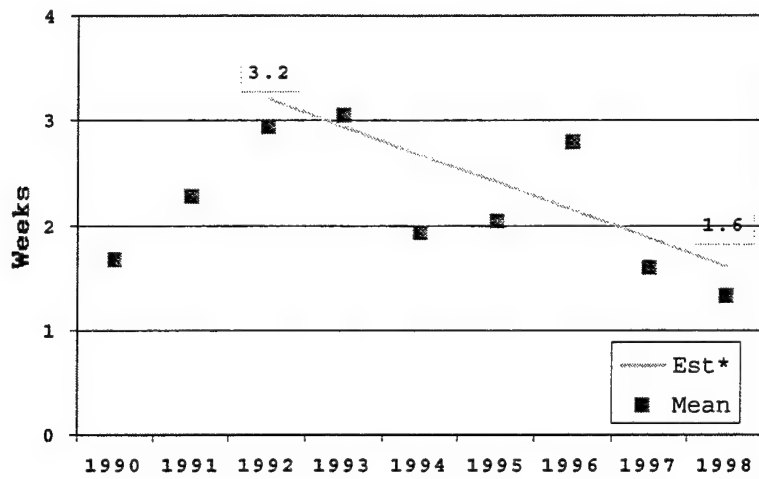


Figure D.17: Weeks Spent Deployed to CTCs (AR Officers)



E. CAREER HISTORIES

This appendix amplifies some of the information presented in Chapter 5 about the career histories of officers who left key positions in 1990 and 1998. As in Chapter 5, the following figures show the average time spent in assignments overall (TOT TIME), as well as in two subsets of that time: TOE vs. TDA time (i.e., time spent in TOE unit assignments and time spent in TDA unit assignments), and leadership (LDRSHIP) vs. staff (STF) time (i.e., time spent in command and platoon leader assignments and time spent in other types of assignments). Averages for platoon leaders, company commanders, battalion S3s and XO's, brigade S3s and XO's, and battalion and brigade commanders were presented in Chapter 5. The figures below present additional detail for officers who held these positions for the first time, and for those who had already held a like assignment at least once previously. This information is presented for platoon leaders and company commanders, and for Infantry battalion XO's and brigade S3s; for the other position types, the numbers of first- and second-or-more position holders were sufficiently small as to make distinctions between the two groups uninteresting. The underlying values for these figures, as well as for the overall averages for each position type, can be found in Tables E.1 and E.2 at the end of this appendix. Tables E.3 and E.4 that follow show additional detail about how the category of "leadership" time was allocated between platoon leader and company, battalion and brigade command, by position type. Branch-qualifying tie as Majors is also included. As with earlier figures, statistically significant differences ($p \leq 0.1$) are marked with an asterisk.

Infantry Officers

As Figures E.1 and E.2 show, although the total amount of time platoon leaders (both first-time and repeat platoon leaders) had spent in unit assignments did not change on average between 1990 and 1998, the allocation of that time did shift. Both groups of platoon leaders saw statistically significant declines in TOE and leadership (i.e., platoon leader) time, and increases in TDA and staff assignments.

Figure E.1: Career Histories, 1st-Time Platoon Leaders (IN Officers)

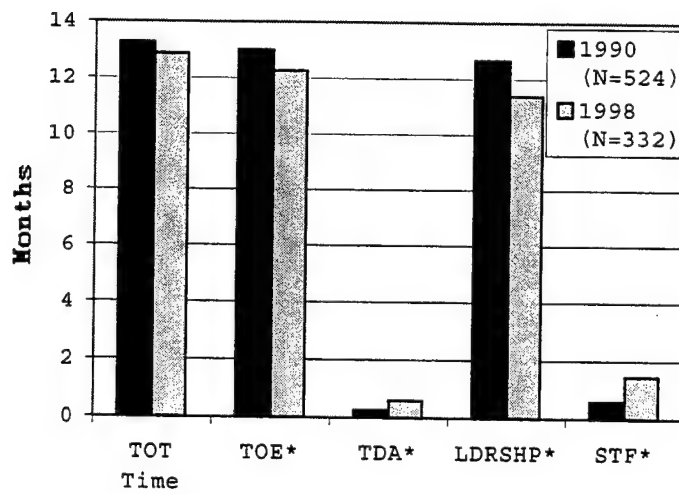


Figure E.2: Career Histories, Repeat Platoon Leaders (IN Officers)

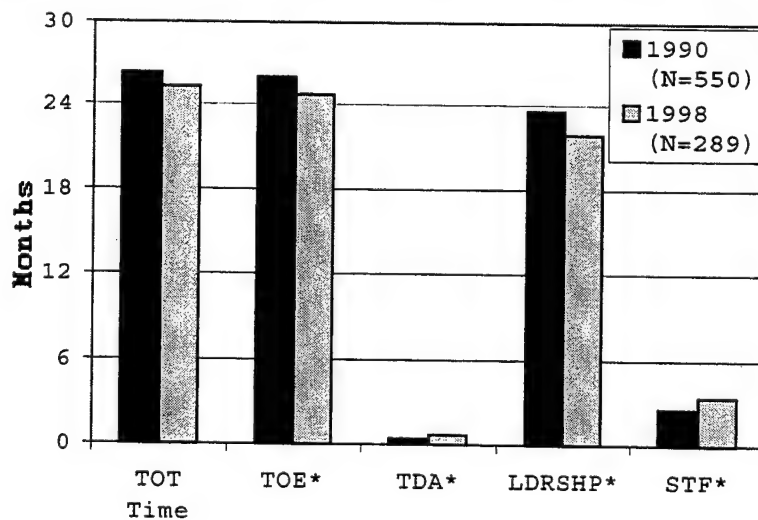


Figure E.3: Career Histories, 1st-Time Company Commanders (IN Officers)

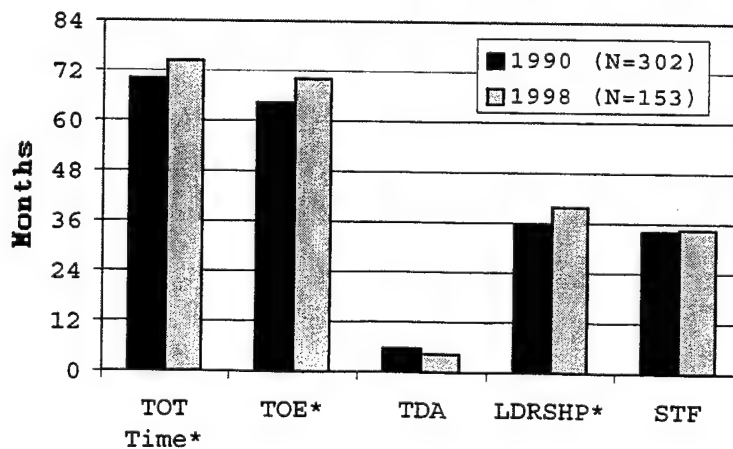
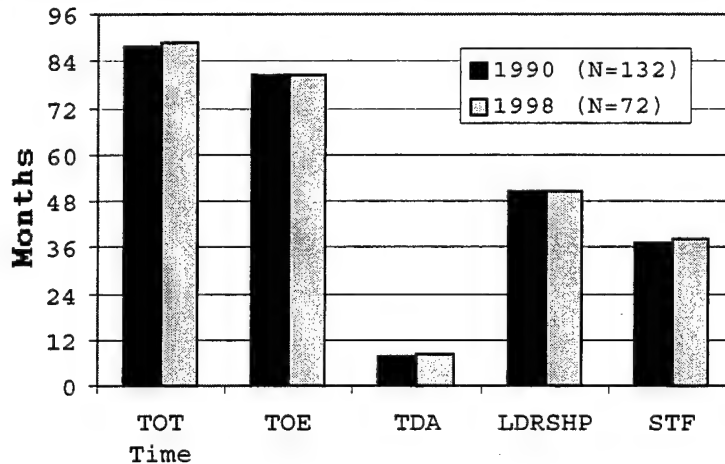


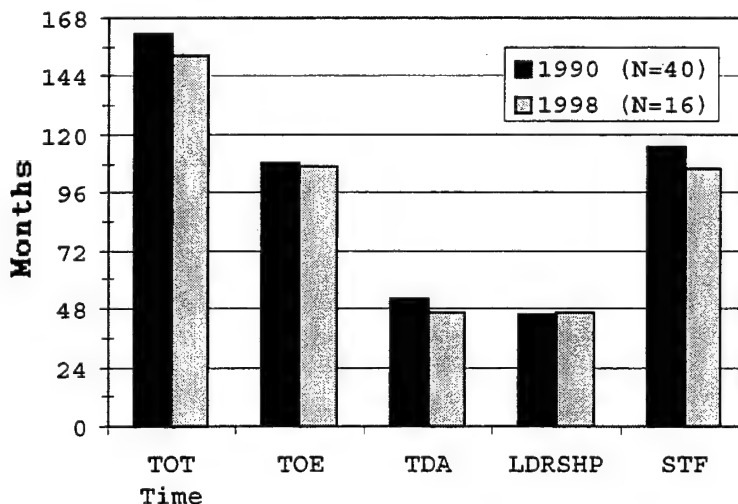
Figure E.3 shows that first-time company commanders in 1998 had spent more overall time in unit assignments (i.e., that they were more senior than like commanders in 1990), and that more of this time had been spent in TOE units and in leadership assignments.

Figure E.4: Career Histories, Repeat Company Commanders (IN Officers)



As shown in Figure E.5, there were no significant changes in the career histories of repeat company commanders.

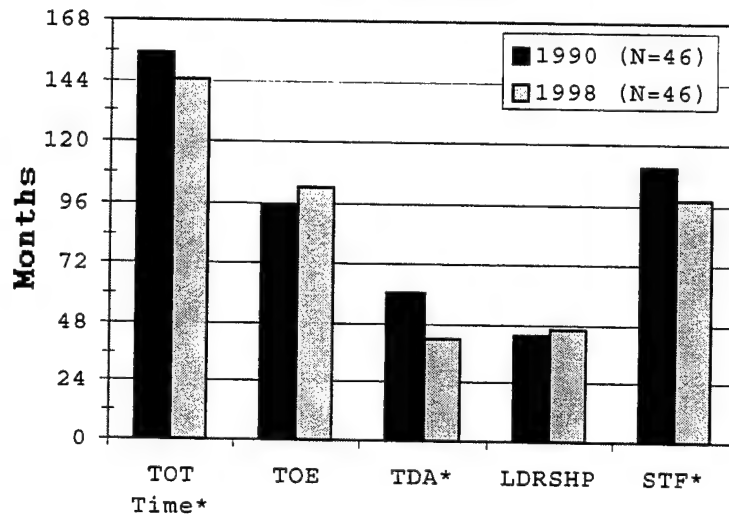
Figure E.5: Career Histories, 1st-Time BN XOs (IN Officers)



First-time battalion XOs in 1998 had spent less total time in unit assignments, due to decreases in TDA and staff positions, than did like officers in 1990. (Time in TOE and leadership positions did increase, but not significantly.)

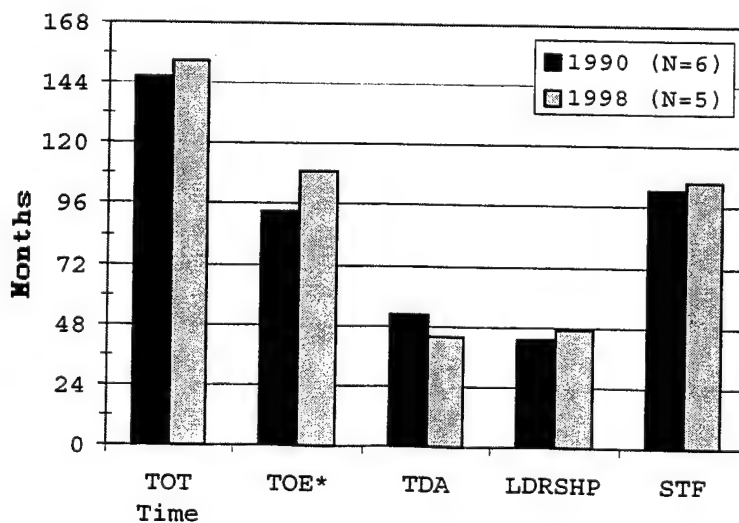
Battalion XO's who had already held at least one earlier XO or S3 assignment displayed the same basic patterns (i.e., less total assignment time, and less in TDA units and in staff positions), but none of these differences were statistically significant.

Figure E.6: Career Histories, BN XO's with Prior BQ Experience (IN Officers)



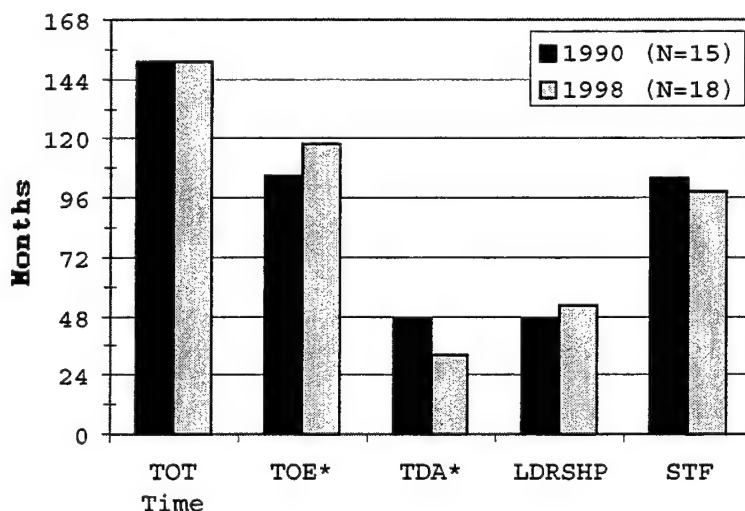
The number of first-time brigade S3s was small in both 1990 and 1998 (six of 21 in 1990, five of 23 in 1998), which meant that differences in career patterns were less likely to be statistically significant. In fact changes in time spent in various assignments was fairly similar, although as Figure E.7 shows, S3s in 1998 had spent significantly more (15.5 months) time in TOE unit assignments than had like officers in 1990.

Figure E.7: Career Histories, 1st-Time BDE S3s (IN Officers)



The same held true for brigade S3s with prior BQ experience (over 70 percent of all S3s in both 1990 and 1998) - in 1998, they had had spent more time in TOE unit assignments, but also significantly less time in TDA positions. The changes in overall time in unit assignments, and in leadership and staff positions, were small enough to be potentially due to chance.

Figure E.8: Career Histories, BDE S3s with Prior BQ Experience (IN Officers)



Armor Officers

Figures E.9 through E.12 present the same information for Armor platoon leaders and company commanders. Figures are not shown for battalion XO's because there were no significant differences between 1990 and 1998 for either first-time XO's or XO's with prior branch-qualifying experience. Nor are brigade S3s included, because at least 80 percent of the S3s in both 1990 and 1998 had had prior BQ assignments, so distinctions between the two groups were not meaningful.

Figure E.9: Career Histories, 1st-Time Platoon Leaders (AR Officers)

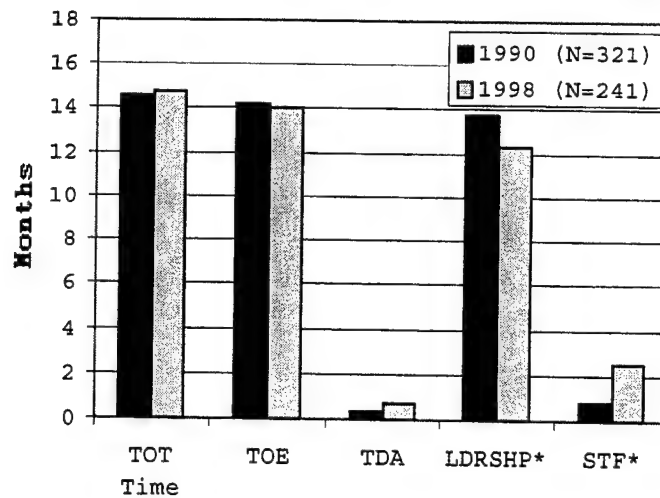
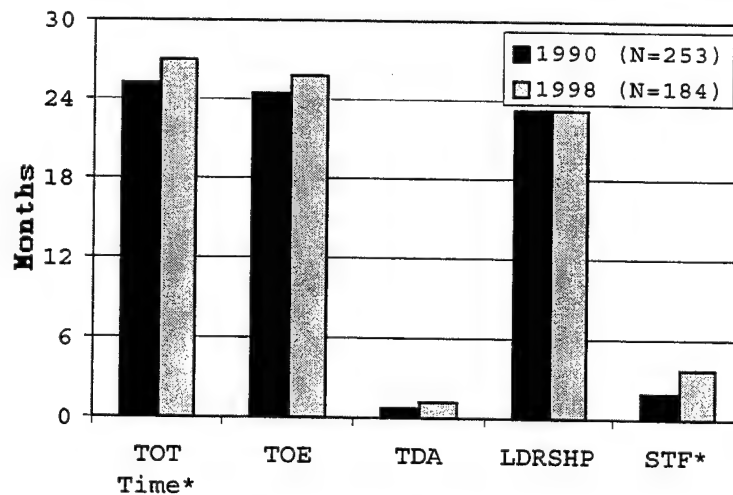
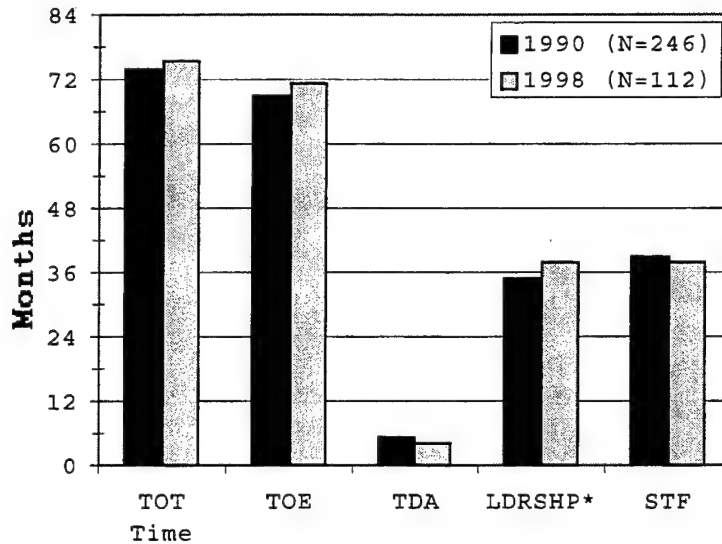


Figure E.10: Career Histories, Repeat Platoon Leaders (AR Officers)



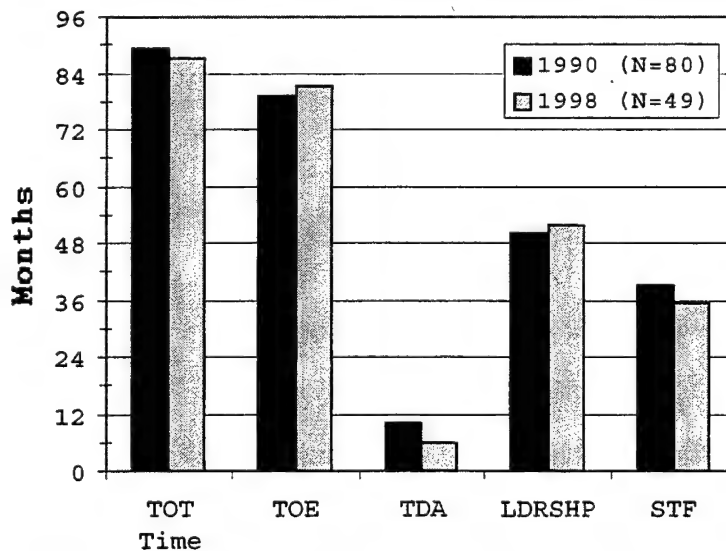
First-time platoon leaders in 1998 spent about the same amount of time in unit positions overall, but their platoon leader assignments were shorter by about two months and they had spent more time in staff positions. Repeat platoon leaders in 1998, on the other hand, had spent about the same amount of total time in all of their platoon leader positions as had repeat platoon leaders in 1990; they too had spent more time in staff positions, but this was reflected in an increase in total time spent in unit assignments overall.

Figure E.11: Career Histories, 1st-Time Company Commanders (AR Officers)



The only significant difference between 1990 and 1998 for first-time company commanders was in the amount of time they had spent in leadership positions (i.e., company command and platoon leader assignments). Later commanders averaged almost three months more in leadership jobs than had first-time commanders in 1990.

Figure E.12: Career Histories, Repeat Company Commanders (AR Officers)



Patterns of change between assignment types were similar for repeat company commanders to those departing their first command, though

none of the changes between 1990 and 1998 were statistically significant for repeat commanders.

The charts on the following page show the actual number of months spent in various assignment types, with an overall average and further distinction between first- and repeat position holders, where relevant.

Table E.1: Career Histories of Time Spent in Assignments (IN Officers)

	N		Tot Time		Tot TOE		Tot TDA		Tot Leadership		Tot Staff						
	1990	1998	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ			
PLT LDR	1074	621	20.0	18.7	-6.5%*	19.7	18.1	-8.1%*	0.3	0.7	133.3%*	18.3	16.4	-10.4%*	1.7	2.4	41.2%*
	524	332	13.3	12.9	-3.1%	13.0	12.3	-5.4%*	0.3	0.6	100.0%*	12.7	11.4	-10.2%*	0.6	1.5	150.0%*
2nd PLT LDR	550	289	26.3	25.4	-3.5%	26.0	24.7	-5.0%*	0.4	0.7	75.0%*	23.7	22.0	-7.2%*	2.6	3.4	30.8%*
CO CDR	434	225	75.3	79.1	5.0%*	69.1	73.6	6.5%*	6.2	5.5	-12.7%	40.2	43.4	8.0%*	35.1	35.7	1.7%
1st CO CDR	302	153	69.9	74.5	6.6%*	64.3	70.3	9.3%*	5.6	4.1	-36.6%	35.6	39.9	12.1%*	34.3	34.6	0.9%
2nd CO CDR	132	72	87.7	88.9	1.3%	80.3	80.6	0.4%	7.5	8.3	9.6%	50.7	50.8	0.2%	37.0	38.1	2.9%
BN S3	75	59	141.1	140.0	-0.8%	92.3	102.3	10.8%*	48.8	36.7	-24.8%*	47.0	50.8	7.5%	94.1	89.2	-5.5%
BN XO	86	62	158.0	146.3	-7.4%*	101.3	103.3	1.9%	56.7	43.0	-24.2%*	45.0	46.1	2.4%	113.0	100.2	-11.3%*
1st BN XO	46	46	155.3	144.1	-7.2%*	94.8	102.2	7.2%	60.5	41.9	-30.7%*	44.2	46.0	3.9%	111.1	98.1	-11.7%*
Prior BQ XO	40	16	161.1	152.7	-5.5%	108.7	106.6	-2.0%	52.4	46.1	-13.7%	45.9	46.3	0.9%	115.2	106.3	-8.4%
BDE S3	21	23	149.8	151.2	0.9%	101.5	116.3	14.6%*	48.3	35.0	-27.5%*	46.1	51.0	9.6%	103.7	100.2	-3.5%
1st BDE S3	6	5	146.2	152.8	4.3%	93.3	108.8	16.6%*	52.8	44.0	-20.0%	43.3	47.2	8.3%	102.8	105.6	2.7%
Prior BQ S3	15	18	151.3	150.8	-0.3%	104.8	118.3	12.9%*	46.5	32.4	-30.3%*	47.2	52.1	9.4%	104.1	98.7	-5.5%
BDE XO	20	17	190.9	163.9	-14.1%*	117.2	120.4	2.7%	73.7	43.5	-41.0%*	43.4	50.7	14.4%	147.5	113.2	-30.3%*
BN CDR	44	32	208.7	195.1	-6.5%*	135.2	148.1	9.5%*	73.5	46.9	-36.2%*	67.4	76.7	13.8%*	141.3	118.4	-16.2%*
BDE CDR	12	11	225.9	232.2	2.7%	130.9	175.9	34.4%*	95.0	55.3	-41.8%*	79.9	82.0	2.6%	146.0	149.2	2.1%

Table E.2: Career Histories of Time Spent in Assignments (AR Officers)

	N		Tot Time		Tot TOE		Tot TDA		Tot Leadership		Tot Staff						
	1990	1998	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ			
PLT LDR	574	425	19.3	20.5	5.9%	18.7	19.1	2.1%	0.6	0.9	50.0%*	17.9	17.0	-5.3%	1.4	3.0	114.3%*
	321	241	14.6	14.8	1.4%	14.2	14.0	-1.4%	0.4	0.7	42.9%	13.8	12.3	-10.9%*	0.8	2.5	212.5%*
2nd PLT LDR	253	184	25.2	27.0	7.1%*	24.5	25.8	5.0%	0.8	1.2	33.3%	23.2	23.3	0.4%	2.0	3.7	85.0%*
CO CDR	326	161	77.8	79.1	1.6%	71.4	74.3	4.1%*	6.4	4.7	-36.2%	38.7	42.0	8.5%*	0.9	1.1	18.2%
1st CO CDR	246	112	74.0	75.5	2.0%	68.9	71.3	3.4%	5.1	4.2	-21.4%	35.0	37.8	8.0%*	39.0	37.7	-3.4%
2nd CO CDR	80	49	89.3	87.2	-2.4%	79.2	81.2	2.5%	10.1	5.9	-71.2%	50.1	51.6	2.9%	39.2	35.5	-10.4%
BN S3	48	36	143.3	140.7	-1.8%	93.7	98.0	4.4%	49.7	42.7	-16.4%	40.9	42.9	4.7%	102.4	97.7	-4.8%
BN XO	65	39	155.8	154.2	-1.0%	104.6	103.4	-1.2%	51.2	50.8	-0.8%	42.2	44.4	5.0%	113.6	109.8	-3.5%
1st BN XO	31	32	155.4	153.7	-1.1%	99.4	100.8	1.4%	56.0	52.9	-5.9%	42.3	45.3	6.6%	113.1	108.3	-4.4%
Prior BQ XO	34	7	156.2	156.9	0.4%	109.3	115.4	5.3%	46.9	41.4	-13.3%	42.2	40.3	-4.7%	114.0	116.6	2.2%
BDE S3	15	10	152.3	145.3	-4.8%	105.3	105.6	0.3%	47.0	39.7	-18.4%	39.1	42.0	6.9%	113.2	103.3	-9.6%
BDE XO	13	10	192.5	168.3	-12.6%*	121.5	113.3	-7.2%	71.0	55.0	-29.1%	44.8	38.3	-17.0%	147.7	130.0	-13.6%
BN CDR	46	14	204.7	198.4	-3.2%	126.5	148.6	17.5%*	78.2	49.8	-36.3%*	61.6	64.6	4.6%	143.1	133.7	-7.0%
BDE CDR	5	7	235.0	226.4	-3.8%	144.2	154.3	6.5%	90.8	72.1	-25.9%	89.8	81.3	-10.5%	145.2	142.0	-2.3%

Table Notes: All 1990 and 1998 values, with the exception of Ns, are in months. Statistically significant ($p < 0.1$) differences are marked with bold type, an asterisk, and dark borders around the cell. Overall averages are not split out into first-time and repeat position holders when these groups represent less than 20 percent of the total officers in that type of assignment.

Table E.3: Career Histories of Time Spent in Leadership Assignments (IN Officers)

	Tot PLT LDR Time			Tot CO CMD Time			Tot BN CMD			Tot BDE CMD			Tot BQ		
	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ
PLT LDR	18.3	16.4	-10.4%*												
1st PLT LDR	12.7	11.4	-10.2%*												
2nd PLT LDR	23.7	22.0	-7.2%*												
CO CDR	20.0	23.3	16.5%*	20.3	20.1	-1.0%									
1st CO CDR	19.9	23.1	16.1%*	15.7	16.8	7.0%*									
2nd CO CDR	20.0	23.8	19.0%*	30.7	27.0	12.1%*									
BN S3	22.2	22.6	1.8%	24.8	28.2	13.7%*									
BN XO	21.1	19.0	-11.1%	23.9	27.1	13.4%*							15.9	13.7	-13.8%*
1st BN XO	20.5	19.0	-7.9%	23.7	27.0	12.2%							21.2	15.3	-27.8%*
Prior BQ XO	21.7	19.0	-14.2%	24.3	27.4	11.3%							14.5	12.9	-11.0%*
BDE S3	23.8	21.7	-9.7%	22.3	29.3	31.4%*							28.8	22.3	-22.6%*
1st BDE S3	23.8	20.0	-19.0%	19.5	27.2	28.3%							25.2	23.1	-9.1%
Prior BQ S3	23.7	22.1	-7.2%	23.5	29.9	27.2%*							14.3	17.0	15.9%
BDE XO	14.3	17.8	19.7%	27.6	31.4	12.1%							29.6	24.8	-16.2%*
BN CDR	11.3	20.0	77.0%*	28.8	29.8	3.4%	27.3	26.9	-1.5%				32.0	27.2	-15.0%*
BDE CDR	4.8	12.1	152.1%*	20.7	19.8	-4.5%	30.8	25.5	-20.8%	23.7	24.5	3.3%	20.2	30.3	50.0%*
													20.1	31.4	56.2%*

Table E.4: Career Histories of Time Spent in Leadership Assignments (AR Officers)

	Tot PLT LDR Time			Tot CO CMD Time			Tot BN CMD			Tot BDE CMD			Tot BQ		
	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ	1990	1998	%Δ
PLT LDR	17.9	17.0	-5.3%												
1st PLT LDR	13.8	12.3	-10.9%*												
2nd PLT LDR	23.2	23.3	0.4%												
CO CDR	18.7	23.3	24.6%*	20.0	19.7	-1.5%									
1st CO CDR	18.8	21.8	16.0%*	16.2	15.9	-1.9%									
2nd CO CDR	18.4	23.4	27.2%*	30.7	28.3	-7.8%*									
BN S3	18.3	18.4	0.06%	22.7	24.6	7.7%									
BN XO	16.4	18.4	11.9%	25.9	26.0	0.4%							15.2	13.0	-16.9%
1st BN XO	16.8	19.3	13.0%	25.5	26.0	1.9%							22.8	15.9	-30.3%*
Prior BQ XO	15.9	14.6	-8.9%	26.3	25.7	-2.3%							16.1	13.5	-16.1%*
BDE S3	15.1	16.8	11.1%	24.0	25.2	4.8%							28.9	27.0	-7.0%
1st BDE S3	0.0	21.5	*	25.5	20.5	-24.4%							24.3	23.0	-5.7%
Prior BQ S3	17.4	15.6	-11.2%	23.8	26.4	9.8%							9.0	8.5	-5.9%
BDE XO	13.5	16.0	15.6%	29.3	22.3	-31.4%							26.7	26.6	-0.4%
BN CDR	12.7	12.9	1.6%	24.0	26.8	10.4%	24.9	24.9	0.0%				34.9	31.0	-12.6%
BDE CDR	6.2	13.4	216.1%	22.6	21.3	-6.1%	37.4	22.0	-70.0%	23.6	24.6	4.1%	23.4	26.1	10.3%
													26.2	32.7	19.9%

BIBLIOGRAPHY

- Abrams, GEN John, "Statement," House Armed Services Committee, Military Readiness Subcommittee (Washington, DC) 4 March 1999, (www.house.gov/hasc/testimony/106thcongress/99-03-04abrams.htm) accessed on 4/14/99.
- Ackerman, Phillip, "Learning and Individual Differences: An Ability/Information-Processing Framework for Skill Acquisition" (University of Minnesota, Department of Psychology: Minneapolis, MN) 15 March 1993.
- Agoglia, MAJ John F., "Leader Development: Leveraging Combat Power Through Leadership," (School of Advanced Military Studies, US Army Command and General Staff College: Ft. Leavenworth, KS) 17 December 1993.
- Anderson, John R., "Skill Acquisition: Compilation of Weak-Method Problem Solutions," *Psychological Review*, 94:2 (1987): 192-210.
- Argetsinger, Amy, "U.S. Naval Academy Analyzes Personality Types To Slow Dropout Rate," *Washington Post* 25 October 1999: B1.
- Armour, MAJ Michael D. (ARNG), "Decision-Making Processes," *Military Review* (LXXIV: 4) April 1994: 70-74.
- Army Science Board, 1996 Summer Study Final Report, Army Simulation Implementation and Use (Department of the Army, Assistant Secretary for Research, Development, and Acquisition: Washington, DC) April 1997.
- Aviolo, Bruce, and Jane Howell, "The Impact of Leadership Behavior and Leader-Follower Personality Match on Satisfaction and Unit Performance" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Bass, Bernard M., "Leading in the Army After Next," *Military Review* March-April 1997: 46-57.
- "BBS Information Paper," 11 February 1998 (ATZL-NSC-F), www-leav.army.mil/nsc/famsim/bbs/infopapr.htm, accessed 3 March 1999.
- Bellini, MAJ Mark A. Is Getting There Half the Battle? Considerations for Deployment of Forces, (School of Advanced Military Studies, US Army Command and General Staff College: Ft. Leavenworth, KS) 1992.
- Benjamin, Beth A., Leadership Development in the Private Sector: Trends, Progress and Speculation, AB-166-A (RAND: Santa Monica, CA) September 1997.
- Bennis, Warren, "Followers Make Good Leaders Good," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Bettin, Patrick, Peggy Hunt, Jennifer Macaulay and Susan Murphy, "Shido: Effective Leadership in Japan" in Kenneth Clark, Miriam Clark, and

- David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Blair, John, and Joan Rivera, "A Stakeholder Management Perspective on Strategic Leadership," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 81-103.
- Blake, Rex, and Earl Potter III, "Novice Leaders, Novel Behaviors, and Strong Culture: Promoting Leadership Change Beyond the Classroom" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Boal, Kimberly, and Carlton Whitehead, "A Critique and Extension of the Stratified Systems Theory Perspective," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 237-253.
- Bolman, Lee, and Terrence Deal, "Reframing Leadership: The Effects of Leaders' Images of Leadership" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Bonadonna, Maj. Reed, "Above and Beyond: Marines and Virtue Ethics," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Botthers, Jr., MAJ Robert, "The Proliferation of Peace Operations and US Army Tactical Proficiency: Will the Army Remain a Combat Ready Force?" (School of Advanced Military Studies, United States Army Command and General Staff College: Fort Leavenworth, KS) 1995.
- Brass, Daniel J., "The Social Capital of 21st Century Leaders," Pennsylvania State University, University Park, PA, Prepared for the symposium "Leadership Challenges of the Twenty-First Century Army," 27-29 March, 1996, Wheaton, IL.
- Bryant, COL Albert (USA), and Joan Dietrich Silver, "CAS3 Fifteen Years Later," *Military Review*, Nov-Dec 1996: 67-70.
- Buck, LTC Joel (USA), "Reflections on Leadership," *Military Review*, Nov-Dec 1996: 41-44.
- Burns, James MacGregor, Leadership (Harper & Row, Publishers: New York, NY) 1978.
- Campbell, David, "The Leadership Characteristics of Leadership Researchers," in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Casey, BG John, "Statement," House Armed Services Committee, Military Readiness Subcommittee, Field Hearing (Naples, Italy) 8 March 1999 (www.house.gov/hasc/testimony/106thcongress/99-03-08casey.htm) accessed on 14 April 1999.
- Center for Army Leadership, "The STRIKE FORCE Environment: Implications for Army Leader Development -- A Task Force T-L-S Concept Paper," DRAFT, 19 February 1999.

- Charness, Neil, Ralf Krampe, and Ulrich Mayr, "The Role of Practice and Coaching in Entrepreneurial Skill Domains: An International Comparison of Life-Span Chess Skill Acquisition," in K. Anders Ericsson, ed., The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1996: 51-80.
- Chilcoat, MG Richard, Strategic Art: The New Discipline for 21st Century Leaders (Strategic Studies Institute, US Army War College: Carlisle Barracks, PA) 10 October 1995.
- Clark, Colin, "Scarce Dollars Threaten Army Readiness, Weapons," *Defense Week*, 13 July 1998: 1+.
- Clark, Kenneth, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Clarke, General Bruce C. USA (Ret), "Commandership: Essential Leadership for a Winning Army," *Army Logistician*, May-June 1985: 10-11.
- Cohen, Jonathan, and Jonathan Schooler, eds. Scientific Approaches to Consciousness (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1997.
- Cohen, MG William, "Insights: Battle Leadership Examples from the Field," *Military Review* (LXXXIX:3) May-June 1999: 82-86.
- "Combat Training Center (CTC) Overview," Reading 4-2 from Command and General Staff Officers Course Student Text 22-3, Leadership: Selected Readings, www-cgsc.army.mil/cal/lid/courses/ST223/rd.-4-2.htm, accessed 10 February 1999.
- Commissioned Officer Development and Career Management, DA PAM 600-3 (Headquarters, Department of the Army: Washington, DC) 8 June 1995.
- Compton, William, "Development of a Self-Report Measure of Self-Relevant Feedback: Initial Validation," *Psychological Reports*, Vol. 67, 1990: 641-642.
- Cowan, David, C. Marlene Fiol, and James Walsh, "A Midrange Theory of Strategic Processes," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 63-79.
- Craig, LTC Donald, "Designing a Battalion Leadership Development Program," *Military Review* (LXXXIX: 3) May-June 1999: 7-17.
- Cronin, Thomas, "Reflections on Leadership," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence, Robert L. Taylor and William Rosenbach, eds. (Westview Press: Boulder, CO) 1996.
- Cunningham, Ian, "The Impact of Who Leaders Are and What They Do" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Curphy, Gordon, "An Empirical Investigation of the Effects of Transformational and Transactional Leadership on Organizational Climate, Attrition, and Performance" in Kenneth Clark, Miriam

- Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Deluga, Ronald, "The Relationship of Leader-Member Exchanges with Laissez-Faire, Transactional, and Transformational Leadership in Naval Environments" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Demma, Vincent, "Army Personnel Policies: An Overview, 1983-1993" (Center of Military History: xx) 31 October 1994.
- Diedrich, John, "Army Chief of Staff to Focus on Recruiting," *Colorado Springs Gazette*, 22 July 1999.
- Donnelly, Tom, "One War Too Many," *Jane's Defence Weekly*, 8 December 1999.
- Dorfman, Peter, Jon Howell, Benjamin Cotton, and Uday Tate, "Leadership Within the 'Discontinuous Hierarchy' Structure of the Military: Are Effective Leadership Behaviors Similar Within and Across Command Structures?" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- "Downsizing Is Leaving Troops Ill-Prepared, Military Officials Say," Associated Press, *San Diego Union-Tribune*, 28 February 1999.
- Dreyfus, Hubert L., "Intuitive, Deliberative, and Calculative Models of Expert Performance," in Caroline Zsombok and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J. : L. Erlbaum Associates) 1997: 17-28.
- Drillings, Michael, and Daniel Serfaty, "Naturalistic Decision Making in Command and Control," in Caroline Zsombok and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J. : L. Erlbaum Associates) 1997: 71-80.
- Dubik, BG James (USA), "The Army's Second Training Revolution," *News From the Front!* Jan-Feb 1998.
- Dunivin, Lt. Col. Karen O., "Military Culture: Change and Continuity," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Eden, LTC Steven, "Leadership on Future Fields: Remembering the Human Factor in War," *Military Review* (LXXXIX: 3) May-June 1999: 35-38.
- Edwards, Mark, "In-Situ Team Evaluation: A New Paradigm for Measuring and Developing Leadership at Work" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- The Effects of Peace Operations on Unit Readiness (Center for Army Lessons Learned: Fort Leavenworth, KS) February 1996.
- Ellis, MG Larry, "Statement," House Armed Services Committee, Subcommittee on Military Readiness, Field Hearing (Naples, Italy) 8 March 1999, (www.house.gov/hasc/testimony/106thcongress/99-03-08ellis.htm) accessed on 4 April 1999.

- Ericsson, K. Anders, "The Acquisition of Expert Performance: An Introduction to Some of the Issues," in K. Anders Ericsson, ed. The Road To Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ), 1997: 1-50.
- _____, ed., The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1996.
- Evans, Michael, "Military History in the Education of Western Army Officers," in Hugh Smith, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: 121-143.
- Fiedler, Fred, "The Role and Meaning of Leadership Experience" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- _____, Leadership Experience and Leadership Performance (United States Army Research Institute for the Behavioral and Social Sciences: Alexandria, VA) 1994.
- Fleishman, Edwin, and Michael Mumford, "Abilities as Causes of Individual Differences in Skill Acquisition," *Human Performance* (II:3) 1989: 201-223.
- Foote, Sheila, "Services Concerned About Adequacy of Training Ranges," *Defense Daily*, 28 October 1998: 6.
- Forsythe, George, "The Preparation of Strategic Leaders," *Parameters*, (22:1), Spring 1992: 38-49.
- Ft. Hood Leadership Study (Center for Army Leadership: Ft. Leavenworth, KS), 24 November 1986.
- Fuller, MG J. F. C., Generalship: Its Diseases and Their Cure, A Study in the Personal Factor in Command (Military Service Publishing Co.: Harrisburg, PA) 1936.
- Geier, LTC Richard P. (USA), "Training Operational Experts for War," *Military Review* (LXXII: 1) January 1992: 73-80.
- Gilbert, LTC Douglas, "Leader XXI Campaign Plan," *Military Review*, Jan-Feb 1996: 50-55.
- Glaser, Robert, "Changing the Agency for Learning: Acquiring Expert Performance," in K. Anders Ericsson, ed., The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1996: 303-311.
- Graham, Bradley, "For the Tank, A New Tread of Thought," *Washington Post*, 6 November 1999: 3.
- Grange, MG David, "Ready for What," *Armed Forces Journal International*, December 1999: 42.

- Green, LtCol Richard (ANG), The Leadership Sum (U.S. Army War College: Carlisle Barracks, PA) 15 April 1992.
- Grossman, Dave LTC, On Killing (Little, Brown and Company: Boston), 1995.
- Hallmark, Bryan, James Crowley, Thomas Lippiatt, and Patricia Dey, Constructing a Database on Training Activity and Time Allocation for Army Heavy Brigades, DRAFT DRR-1993-A (RAND: Santa Monica, CA) September 1998 (release subject to approval of US Army Forces Command).
- Halpin, Stanley, The Human Dimensions of Battle Command: A Behavioral Sciences Perspective on the Art of Battle Command (United States Army Research Institute Battle Command Task Force Report: Ft. Leavenworth, KS) 1995.
- Hamburger, LTC K.E., and USMA History Department, Leadership in Combat: An Historical Appraisal (Officer Personnel Management System Study Group, Department of the Army: Washington, DC) 1984.
- Hamilton, Mark R., "Junior Officer Development: Reflections of an Old Fud," *Parameters*, September 1990: 63-70.
- Hammerschmidt, Peter, and Andrew Jennings, "The Impact of Personality Characteristics on Leadership Effectiveness Ratings" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Hanrieder, Wolfram and Larry Buel, Words and Arms: A Dictionary of Security and Defense Terms (Westview Press: Boulder, CO) 1979.
- Harback, LTC Herbert F. (USA), "The Threat to Strategic Leadership," *Military Review*, November 1992: 32+.
- _____, "Leadership Lessons from Downsized Corporate America," *Military Review* (LXXIII: 8), August 1993: 24-31.
- Harig, Paul, "The Digital General: Reflections on Leadership in the Post-Information Age," *Parameters*, Autumn 1996: 133-140.
- Harris, Beverly, "Perceptions of Army Officers in a Changing Army," Research Report 1662 (US Army Research Institute: Alexandria, VA) June 1994.
- Hassebrock, Frank, Paul Johnson, Peter Bullemer, Paul Fox, and James Moller, "When Less is More: Representation and Selective Memory in Expert Problem Solving," *American Journal of Psychology*, Summer 1993: 155-189.
- Heifetz, Ronald, Leadership Without Easy Answers (Belknap Press: Cambridge, MA) 1994.
- Hickling, MG Frank, "Employing Battlefield Leaders: Winning the Fight," in Hugh Smith, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: 35-46.
- Hitt, Michael, and Barbara Keats, "Strategic Leadership and Restructuring: A Reciprocal Interdependence," in Robert Phillips

- and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 45-61.
- Hix, W. Michael, Herbert Shukiar, Janet Hanley, Richard Kaplan, Jennifer Kawata, Grant Marshall, and Peter Stan, Personnel Turbulence: The Policy Determinants of Permanent Change of Station Moves MR-938-A (RAND: Santa Monica, CA) 1998.
- Hooijberg, Robert, and Robert Quinn, "Behavioral Complexity and the Development of Effective Management," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 161-175.
- _____, R. Craig Bullis, and Jerry Hunt, "Behavioral Complexity and the Development of Military Leadership for the 21st Century," paper prepared for Cantigny Conference, March 1996.
- Horner, LTC Donald Jr. (USA), "A Different Twist: Nonrational Views of Leadership," Military Review, Nov-Dec 1996: 45-50.
- Hunt, James, and Robert Phillips, "1996 Army Symposium: "Leadership Challenges of the 21st Century Army" Executive Summary," ARI Research Note 96-63 (United States Army Research Institute for the Behavioral and Social Sciences: Alexandria, VA) May 1996.
- _____, and Arja Ropo, "Stratified Systems Theory and Dynamic Case Study Perspectives: A Symbiosis," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 179-194.
- Ide, SFC Douglas, "Lessons on Leadership," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- "Institutional Leader Training and Education," TRADOC Regulation 351-10 (Department of the Army, Headquarters, United States Army Training and Doctrine Command: Ft. Monroe, VA) 1 May 1997 (<http://www-tradoc.army.mil/tpubs/regs/r351-10.html>).
- Isenhower, CPT James III, CO CDR, 2BN, 8CAV RGT, 1CAV, "Statement," House Armed Services Committee, Subcommittee on Military Readiness, Field Hearing (Naples, Italy) 8 March 1999 (www.house.gov/hasc/testimony/106thcongress/99-03-08isenhower.htm), accessed on 14 April 1999.
- Jacobs, T. Owen, and Philip Lewis, "Leadership Requirements in Stratified Systems," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992.
- Jacques, Elliott, Stephen Clement, Carlos Rigby, and T.O. Jacobs, Senior Leadership Performance Requirements at the Executive Level, Research Report 1420 (US Army Research Institute for the Behavioral and Social Sciences: Alexandria, VA) January 1986.
- Janis, Irving, "Problems Related to the Control of Fear in Combat," in Samuel Stouffer, Arthur Lumsdaine, Marion Harper Lumsdaine, Robin Williams, Jr., M Brewster Smith, Irving Janis, Shirley Star, and Leonard Cottrell, Jr., The American Soldier: Combat and its Aftermath, Volume II (John Wiley & Sons, Inc: New York) 1965.

- Javidan, Mansour, "Managers on Leaders: Developing a Profile of Effective Leadership in Top Management" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Joint Vision 2010 (Joint Chiefs of Staff, Department of Defense: Washington, DC) 1997.
- Julien, Tracye D., and Guy L. Siebold, Unit Leader Assessment of a Joint Readiness Training Center Rotation, Research Report 1564, (U.S. Army Research Institute for the Behavioral and Social Sciences: Alexandria, VA) June 1990.
- Kahan, James, Noreen Webb, Richard Shavelson, and Ross Stolzenberg, Individual Characteristics and Unit Performance: A Review of Research and Methods, R-3194-MIL (RAND: Santa Monica, CA) February 1985.
- Kanfer, Ruth and Philip Ackerman, "Motivation and Cognitive Abilities: An Integrative/Aptitude-Treatment Interaction Approach to Skill Acquisition," *Journal of Applied Psychology* (Vol 74., No. 4) 1989: 657-690.
- Kelley, Robert E., "In Praise of Followers," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Kirkland, Faris R., "The Gap Between Leadership Policy and Practice: A Historical Perspective," *Parameters*, September 1990: 50-62.
- _____, "Combat Leadership Styles: Empowerment Vs. Authoritarianism," *Parameters*, December 1990: 61-72.
- Klein, Gary A., Marvin L. Thordson, and Roberta Calderwood, Descriptive Models of Military Decisionmaking, ARI Research Note 90-93 (United States Army Research Institute for the Behavioral and Social Sciences: Alexandria, VA) August 1990.
- Knauff, E.B., "Translating Research Results Into Action" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Koene, Bas, Johannes Pennings and Hein Schreuder, "Leadership, Organizational Culture, and Organizational Outcomes" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Kolenda, CPT Christopher (USA), "Navigating the Fog of Technological Change," *Military Review*, Nov-Dec 1996: 31-40.
- Kouzes, James M., and Barry Posner, "The Credibility Factor: What People Expect of Leaders," in Robert Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Lacquement, MAJ Richard, Jr. (USA), "Maintaining the Professional Core of the Army," *ARMY*, January 1997: 8+.
- Lambrecht, Judith, Charles Hopkins, Jerome Moss, Jr., Curtis Finch, Importance of On-the-Job Experiences in Developing Leadership

- Capabilities MDS-814 (National Center for Research in Vocational Education, University of California: Berkeley, CA) October 1997.
- Leadership and Change... In A Values-Based Army (Department of the Army: Washington, DC) 1997.
- Leadership and Command at Senior Levels, FM 22-103 (Headquarters, Department of the Army: Washington, DC) June 1987.
- Leadership and Command on the Battlefield: Operations JUST CAUSE and DESERT STORM, TRADOC Pamphlet 525-100-1 (Department of the Army, United States Army Training and Doctrine Command: Ft. Monroe, VA) 1992.
- Leadership and Command on the Battlefield: Battalion and Company, TRADOC Pamphlet 525-100-2 (Department of the Army, United States Army Training and Doctrine Command: Ft. Monroe, VA) 1993.
- Leser, LTC Jeffrey (USA), "Initiative: The Power Behind Intent," *Military Review*, Sept-Oct 1997: 59-64.
- Levi, Ariel, and Larry Mainstone, "Breadth, Focus, and Content in Leader Priority-Setting: Effects on Decision Quality and Perceived Leader Performance" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Lewicki, Pavel, Maria Czyzewska, and Thomas Hill, "Cognitive Mechanisms for Acquiring "Experience": The Dissociation Between Conscious and Nonconscious Cognition," in Jonathan Cohen and Jonathan Schooler, Scientific Approaches to Consciousness (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1997: 161-177.
- Lewis, Philip, and T. Owen Jacobs, "Individual Differences in Strategic Leadership Capacity: A Constructive/Developmental View," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 121-137.
- Li, George, and S. Rajagopalan, "A Learning Curve Model with Knowledge Depreciation," *European Journal of Operational Research*, (105): 143-154, 1998.
- Liddell Hart, B.H., ed. The Rommel Papers (Harcourt, Brace and Company: New York) 1953.
- Livsey, MAJ Timothy (USA), Teaching Tactical Decision Making: What Is Important? (School of Advanced Military Studies, United States Army Command and General Staff College: Ft. Leavenworth, KS) 14 December 1992.
- Lockwood, LTC George, Commander, 3SQN, 7CAV, 3ID, Ft. Stewart, "Statement," House Armed Services Military Readiness Subcommittee, Field Hearing (Nellis AFB, NV), 26 February 1999, (www.house.gov/hasc/testimony/106thcongress/99-02-26lockwood.htm) accessed on 4/14/99.
- Lohmann, David, "The Impact of Leadership on Corporate Success: A Comparative Analysis of the American and Japanese Experience" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact

- of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Lord, LTC Harold W. Jr., LTC Michael J. Petrucci, and LTC Henry C. Ruth (USA), Former Battalion Commander Survey (U.S. Army War College: Carlisle Barracks, PA) 8 April 1991.
- Lydon, John, Mark Zanna, and Michael Ross, "Bolstering Attitudes by Autobiographical Recall: Attitude Persistence and Selective Memory," *Personality and Social Psychology Bulletin*, March 1988: 78-86.
- Malone, Dandridge, "The Integration of Internal Operating Systems: An Application of Systems Leadership," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 219-236.
- Markham, Steven, William Murry and K. Dow Scott, "The Dual Impact of Leadership on Performance Appraisal: A Levels-of-Analysis Perspective" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Marshall, COL S.L.A., Men Against Fire: The Problem of Battle Command in Future War (Peter Smith: Gloucester, MA) 1978.
- _____, "Leaders and Leadership," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Marson, Phyllis, and Cheryl Bruff "The Impact of Classroom Leadership Training on Managerial/Supervisory Job Performance" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Mastaglio, Dr. Thomas, "Training Effectiveness of Simulations," Addendum C, Army Science Board, 1996 Summer Study Final Report, Army Simulation Implementation and Use (Department of the Army, Assistant Secretary for Research, Development, and Acquisition: Washington, DC) April 1997: 74-79.
- Matthews, Dr. Mike, "Captain Attrition at Fort Benning" (Briefing) (Army Research Institute, Infantry Forces Research Unit: Fort Benning, GA) 13 October 1999.
- McAlister, Bill, "Shedding Reserve on Defense," *Washington Post*, 22 June 1999: 15.
- McCall, Morgan W. Jr., High Flyers: Developing the Next Generation of Leaders (Harvard Business School Press: Boston, MA) 1998.
- McCormick, David, The Downsized Warrior: America's Army In Transition, (New York University Press: New York, NY) 1998.
- McCormick, MAJ Michael, USA, "The New FM 100-5: A Return to Operational Art?" *Military Review*, September-October 1997: 3-14.
- McLachlan, Ian, "Keynote Address," in Hugh Smith, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: ix-xiv.

- Meilinger, Phillip S., "The Ten Rules of Good Followership," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Meyer, Edward C., and R. Manning Ancell, with Jane Mahaffey, Who Will Lead? Senior Leadership in the United States Army (Praeger Publishers: Westport, CT) 1995.
- Meyers, Steven Lee, "Training for the Next War, Army Slow to Change," *New York Times* 15 March 1999.
- Military Leadership, FM 22-100, (Headquarters, Department of the Army: Washington, DC) 31 July 1990.
- Morgan, LTC Thomas, USA (Ret), "BCTP: Preparing for War," *Military Review*, November 1989: 3-10.
- Mosier, Kathleen, "Myths of Expert Decision Making and Automated Decision Aids," in Caroline Zsombok and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J.: L. Erlbaum Associates) 1997.
- Napier, 1LT Todd, "Letter to the Editor," *Armor*, July-August 1998: 4.
- Naylor, Sean D., "Are Heavy Divisions Going the Extra Mile for the Training?" *Army Times*, 8 February, 1999: 18.
- _____, "One Awesome Soldier," *Army Times*, 8 February 1999: 12-16.
- _____, "Straight Shooters: Soldiers Sound Off on Readiness Woes," *Army Times*, 15 March 1999: 15+.
- _____, "Most Armor Divisions Fall Short of Training Goal," *Army Times*, 6 December 1999: 10.
- _____, "Captains Parting Company," *Army Times*, 24 January 2000: 12.
- Neal, Dr. William, "Cost Considerations for Modeling and Simulation," Addendum D, Army Science Board, 1996 Summer Study Final Report, Army Simulation Implementation and Use (Department of the Army, Assistant Secretary for Research, Development, and Acquisition: Washington, DC) April 1997: 82-87.
- Newman, Richard, "Can Peacekeepers Make War?" *US News and World Report*, 19 January 1998: 39-44.
- Official Army Leadership Definitions, Appendix A of Command, Leadership, and Effective Staff Support (Information Management Support Center, Pentagon: Washington, DC) October 1996
(http://call.army.mil/call/spc_prod/staffspt/table.htm)
- Ohlsson, Stellan, "Learning from Performance Errors," *Psychological Review* (103:2) April 1996: 241-262.
- Oltmanns, MG Karsten, "Leadership Training -- the German Perspective," in Hugh Smith, ed. *Preparing Future Leaders: Officer Education and Training for the Twenty-first Century* (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: 185-193.
- "'Operations Other Than War' Draining Key Forces, GAO Says," *Aerospace Daily*, 15 July 1999.

- "OPMS XXI Precursor Study: Strategic Vision: The Officer of Force XXI", undated.
- "OPMS XXI Precursor Study Issue Paper: BN CDR Branch Qualification and Functional Area Experience," DRAFT 21 December 1995.
- OPMS XXI Final Report (Department of the Army: Washington, DC) 9 July 1997.
- Pace, Larry, Diane Hartley, and Laura Davenport, "Beyond Situationalism: Subordinate Preferences and Perceived Leader Impact" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Peterson, Morris, "Information Paper: Trends in Captain Attrition," (Army Research Institute, Army Personnel Survey Office: Arlington, VA) 22 October 1999.
- Phillips, Robert, and Catherine Duran, "Effecting Strategic Change: Biological Analogues and Emerging Organizational Structures," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 195-216.
- _____ and James Hunt, "Strategic Leadership: An Introduction," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992.
- _____, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992.
- Pierson, MAJ David, "Natural Killers: Turning the Tide of Battle," *Military Review* (LXXXIX: 3) May-June 1999: 60-65.
- Potter, Earl III, William Rosenbach, and Thane Pittman, "Leading the New Professional," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Pritchard, LTC Kenneth, "Competency-Based Leadership for the 21st Century," *Military Review* (LXXXIX: 3) May-June 1999: 23-26.
- Quast, Louis Jr. and Joy Fisher Hazucha, "The Relationship Between Leaders' Management Skills and Their Groups' Effectiveness" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Reber, Arthur, "How to Differentiate Implicit and Explicit Modes of Acquisition," in Jonathan Cohen and Jonathan Schooler, eds. Scientific Approaches to Consciousness (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1997: 161-177.
- Reimer, General Dennis, "Training: Our Army's Top Priority And Don't You Forget It!" *Military Review*, July-August 1996: 55+.
- _____, "Random Thoughts While Running" CSA 99-02, 26 January 1999, received via email (in possession of the author).

- _____, "Leadership Doctrine: Turning Challenge Into Opportunity," *Military Review* (LXXXIX: 3) May-June 1999: 3-6.
- Results of the Professional Development of Officers Study Surveys:
Report to the Officer Corps (Headquarters, Department of the Army: Washington, DC) April 1985.
- Richman, Howard, Fernand Gobet, James Staszewski, and Herbert Simon, "Perceptual and Memory Processes in the Acquisition of Expert Performance: The EPAM Model," in K. Anders Ericsson, ed., The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1996: 167-187.
- Ricks, Thomas, "U.S. Faces Defense Choices: Terminator, Peacekeeping Globocop or Combination," *Wall Street Journal*, 11 November 1999: 1.
- Riechmann, Donna, "High-Involvement, High-Performance Teams in Higher Education: The Impact of Leadership" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Ridgway, Gen. Matthew B., "Leadership," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996: 108-117.
- Robinson, COL James, "The Rommel Myth," *Military Review*, Sept-Oct 1997: 81-89.
- Rogers, W.H., "Regression Standard Errors in Clustered Samples," *Stata Technical Bulletin*, 13 1993: 19-23.
- Rommel, Field Marshal Erwin, Attacks (Athena Press, Inc: Vienna, VA) 1979.
- Roos, John, "Honing the Cutting Edge," *Armed Forces Journal International*, December 1996: 23.
- Roper, MAJ Daniel, "Peacetime Leadership: A Critical Element of Combat Power," *Military Review* (LXXXIX:3) May-June 1999: 71-76.
- Rosenberger, COL John, "Reaching Our Army's Full Combat Potential in the 21st Century: Insights from the National Training Center's Opposing Force," No. 99-2 (Association of the United States Army: Arlington, VA) February 1999.
- _____, "Statement," Readiness Subcommittee, Committee on National Security, United States House of Representatives, First Session, 106th Congress, 26 February 1999.
- _____, "Reversing the Downward Spiral of Combat Readiness: Change the Way We Measure It," Submitted to *Military Review* for publication, April 1999 (DRAFT, in possession of the author).
- Rosenbloom, Paul, John Laird and Allen Newell, "The Chunking of Skill and Knowledge," Working Models of Human Perception (Academic Press: London) 1988: 391-410.
- Rost, Joseph C., "Leadership Development in the New Millenium," *The Journal of Leadership Studies* (Vol.1, No.1) November 1993: 92-110.

- _____, Leadership for the Twenty-First Century (Praeger: Westport, CT) 1991.
- Russo, Lt.Col. Anthony, "Leadership in the Information Age," *Military Review* (LXXXIX: 3) May-June 1999: 77-81.
- Sanderson, LTG John, "Preparing Leaders of the Twenty-First Century," in Hugh Smith, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: 1-7.
- Sashkin, Marshall, "Strategic Leadership Competencies," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992: 139-160.
- _____, William Rosenbach, Terrence Deal, and Kent Peterson, "Assessing Transformational Leadership and Its Impact" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Savell, Joel, Trueman Tremble, Jr., and Ross Teague, Some Lessons Learned About Leadership in Operation Desert Shield/Storm Study Report 93-05 (U.S. Army Research Institute: Alexandria, VA) July 1993.
- Scales, MG Robert Jr., "America's Army in Transition: Preparing for War in the Precision Age," *Army Issue Paper No. 3* (U.S. Army War College: Carlisle, PA) 1999.
- Scarborough, Rowan, "Army Battles To Retain Strength," *Washington Times*, 27 January 1999: 1.
- Schwartz, GEN Thomas, "Statement," House Armed Services Committee, Military Readiness Subcommittee, Field Hearing (Norfolk, VA) 22 March 1999 (www.house.gov/hasc/testimony/106thcongress/99-03-22schwartz.htm) accessed on 14 April 1999.
- Segal, David, "Environmental Challenges for Strategic Managers," in Robert Phillips and James Hunt, eds. Strategic Leadership: A Multiorganizational-Level Perspective (Quorum Books: Westport, CT) 1992.
- Serfaty, Daniel, Jean MacMillan, Elliot B. Entin, and Eileen B. Entin, "The Decision-Making Expertise of Battle Commanders," in Caroline Zsombok and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J.: L. Erlbaum Associates) 1997.
- Shamir, Boas, and Eyal Ben-Ari, "Leadership in an Open Army? Civilian Connections, Interorganizational Frameworks, and Changes in Military Leadership," Department of Sociology and Anthropology, The Hebrew University, Jerusalem, prepared for Symposium on "Leadership Challenges of the Twenty First Century Army," 27-29 March, 1996, Wheaton, IL.
- Shaud, Gen. John A., USAF (Ret), "The 'Staff Experience' and Leadership Development," *Airpower Journal* (7:1) Spring 1993: 4-11.

- Shinseki, General Eric, *Address to the Eisenhower Luncheon* (Association of the United States Army: Washington, DC) 12 October 1999
(www.hqda.army.mil/ocsa/991012.htm)
- _____, "Manning Task Force Implementation Message", 8 November 1999, in possession of the author.
- "Shinseki Hints at Restructuring, Aggressive Changes for the Army," *Inside the Army*, 28 June 1999: 1.
- Shipper, Frank, and Clark Wilson, "The Impact of Managerial Behaviors on Group Performance, Stress, and Commitment" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Simonton, Dean Keith, "Creative Expertise: A Life-Span Developmental Perspective," in K. Anders Ericsson, ed., The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1996: 227-254.
- Simpson, LTC David (USA), and LTC Richard Brown (USAR), "The Art and Science of Battlefield Visualization," *Military Review*, Nov-Dec 1996: 25-29.
- Smith, Hugh, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998.
- Smith, M. Brewster, "Combat Motivations Among Ground Troops," in Samuel Stouffer, Arthur Lumsdaine, Marion Harper Lumsdaine, Robin Williams, Jr., M Brewster Smith, Irving Janis, Shirley Star, and Leonard Cottrell, Jr., The American Soldier: Combat and its Aftermath, Volume II (John Wiley & Sons, Inc: New York) 1965.
- Sorley, Lewis, "Creighton Abrams and Levels of Leadership," *Military Review* (LXXII: 8), August 1992: 3-10.
- Spence, Floyd, *Military Readiness 1997: Rhetoric and Reality* (U.S. House of Representatives Committee on National Security: Washington, DC) 9 April 1997.
- Spiller, Roger J., "The Tenth Imperative," *Military Review*, April 1989: 2-13.
- Spiszer, MAJ John, "Leadership and Combat Motivation: The Critical Task," *Military Review* (LXXXIX: 3) May-June 1999: 66-70.
- Starry, Gen. Donn A., "Review of On Leadership, by John W. Gardner," *Parameters*, December 1990: 108-110.
- Stasz, Cathleen, Kimberly Ramsey, Rick Eden, Joan DaVanzo, Hilary Farris, and Matthew Lewis, "Classrooms That Work: Teaching Generic Skills in Academic and Vocational Settings," MR-169 (RAND: Santa Monica, CA, and National Center for Research in Vocational Education, University of California: Berkeley, CA) 1993.
- Steele, BG William M. (USA), "Army Leaders: How You Build Them; How You Grow Them," *Military Review* (LXXII: 8) August 1992: 14-20.

- Sternberg, Robert, "Costs of Expertise," in K. Anders Ericsson, ed. The Road to Excellence: The Acquisition of Expert Performance in the Arts and Sciences, Sports, and Games (Lawrence Erlbaum Associates, Publishers: Mahwah, NJ) 1997: 347-354.
- Stewart, Nora Kinzer, Mates and Muchachos: Unit Cohesion in the Falklands/Malvinas War (Brassey's US, Inc: McLean, VA) 1991.
- Stewart, Steven, Leader Development Training Needs Assessment of U.S. Army Battalion Commanders, Technical Report 969 (U.S. Army Research Institute: Alexandria, VA) November 1992.
- Stokesbury, James L., "Leadership as an Art," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Stouffer, Samuel, Arthur Lumsdaine, and Marion Lumsdaine, "Attitudes Before Combat and Behavior in Combat," in Samuel A. Stouffer, Arthur Lumsdaine, Marion Lumsdaine, Robin Williams, Jr., M. Brewster Smith, Irving Janis, Shirley Star, and Leonard Cottrell, Jr., The American Soldier: Combat and Its Aftermath, Volume II (John Wiley & Sons, Inc.: New York) 1965: 3-58.
- _____, Robin Williams, Jr., M. Brewster Smith, Irving Janis, Shirley Star, and Leonard Cottrell, Jr., The American Soldier: Combat and Its Aftermath, Volume II (John Wiley & Sons, Inc.: New York) 1965.
- Stroup, LTG Theodore Jr, USA, "Leadership and Organizational Culture: Actions Speak Louder than Words," *Military Review*, Jan-Feb 1996: 44-49.
- Sullivan, Gordon, "America's Army: Into the Twenty-First Century," National Security Paper #14 (Institute for Foreign Policy Analysis: Cambridge, MA) 1993.
- _____ and Michael V. Harper, Hope Is Not a Method, (Random House: New York, NY) 1996.
- Swan, COL Guy, "Letter to the Editor," *ARMOR*, July-August 1998: 3-4.
- Tallarigo, Richard, and Michael Rosebush, "An Examination of Leader Behaviors, Organizational Climate, and Subordinate Reactions" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Taylor, Robert L., and William Rosenbach, eds., Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- _____, "Followership: Requisite for Effective Leadership," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- _____, "Climate, Culture, and Values," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.

- Thompson, BG Samuel III, "Statement," House Armed Services Military Readiness Subcommittee, Field Hearing (Nellis AFB, NV), 26 February 1999, (www.house.gov/hasc/testimony/106thcongress/99-02-26thompson.htm) accessed on 4/14/99.
- Tice, Jim, "The Busiest Major Command," *Army Times*, 30 October 1995: 22-28.
- _____, "Captain Selection Rate Could Be 98 Percent", *Army Times*, 27 December 1999: 21.
- _____, "Planners Wrestle with Top Personnel Issues," *Army Times*, 24 January 2000: 12.
- Tkacz, Sharon, "Learning Map Interpretation: Skill Acquisition and Underlying Abilities," *Journal of Environmental Psychology* (Vol. 18, No. 3) 1998: 237-249.
- Tooke, COL Lamar (USA) and COL Ralph Allen (USA-Ret), "Strategic Intuition and the Art of War," *Military Review* (LXXV: 2), March-April 1995: 10-18.
- "Training Circular DRAFT " No. 17-12-7-3 (Armor School: Fort Knox, KY) June 1996.
- Training the Force: Soldiers, Units, and Leaders, FM 25-100 (Headquarters, Department of the Army: Washington, DC) November 1998.
- Troshinsky, Lisa, "Virtual Reality Simulation Training: A Vieques Solution?" *Navy News and Underseas Technology* 12 December 1999: 4.
- Uhl-Bien, Mary, and George Graen, "An Empirical Test of the Leadership-Making Model in Professional Project Teams" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Ulmer, LTG Walter, "Leaders, Managers, and Command Climate," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- _____, "Military Leadership into the 21st Century: Another 'Bridge Too Far?'" *Parameters*, Spring 1998: 4-25.
- van Creveld, Martin, "Present and Future War," in Hugh Smith, ed. Preparing Future Leaders: Officer Education and Training for the Twenty-first Century (Australian Defence Studies Centre, Australian Defence Force Academy: Canberra, Australia) 1998: 29-33.
- Van Eron, Ann, and W. Warner Burke, "The Transformational/ Transactional Leadership Model: A Study of Critical Components" in Kenneth Clark, Miriam Clark, and David Campbell, eds. The Impact of Leadership (Center for Creative Leadership: Greensboro, NC) 1992.
- Vinch, Chuck, "Army Aims to Fill All Enlisted Slots in Combat Units," *Pacific Stars and Stripes*, 10 November 1999: 1.
- _____, "Program to Give Army Warfighting Units Their Fill," *European Stars and Stripes*, 19 December 1999: 3.

- Vitas, LT Robert, "Civilian Graduate Education and the Professional Officer," *Military Review* (LXXXIX: 3) May-June 1999: 47-58.
- Waddell, Col. Donald E. III (USAF), "A Situational Leadership Model for Military Leaders," *Airpower Journal* (8:3), Fall 1994: 29-42.
- Wass de Czege, BG Huba (USA), "A Comprehensive View of Leadership," *Military Review* (LXII:8), August 1992: 21-29.
- _____, and MAJ Jacob Biever (USA), "Optimizing Future Battle Command Technologies," *Military Review*, March-April 1998: 15-21.
- Webster, BG William Jr., "Statement," House Armed Services Military Readiness Subcommittee, Field Hearing (Nellis AFB, NV), 26 February 1999, (www.house.gov/hasc/testimony/106thcongress/99-02-26webster.htm) accessed on 4/14/99.
- White, H., "A Heteroskedasticity-consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica* 48 1980: 817-830.
- _____, "Maximum Likelihood Estimation of Misspecified Models," *Econometrica* 50 1982: 1-25.
- Williams, COL Robert, "Statement," House Armed Services Committee, Military Readiness Subcommittee, Field Hearing (Norfolk, VA) 22 March 1999, (www.house.gov/hasc/testimony/106thcongress/99-03-22williams.htm) accessed on 14 April 1999
- Williams, Robin Jr., and M. Brewster Smith, "General Characteristics of Ground Combat," in Samuel A. Stouffer, Arthur Lumsdaine, Marion Lumsdaine, Robin Williams, Jr., M. Brewster Smith, Irving Janis, Shirley Star, and Leonard Cottrell, Jr., The American Soldier: Combat and Its Aftermath, Volume II (John Wiley & Sons, Inc.: New York) 1965: 59-104.
- Wilson, George C., "Promoting the Best Military Commanders," *National Journal*, 4 December 1999: 3481.
- Wood, David, "Military Spending Misses Grunts," *New Orleans Times-Picayune*, 3 March 1999: 1.
- Young, Robert, The Impact of Operations Other Than War on the Midgrade (O-3/4) Army Officer (Army Command and General Staff College: Fort Leavenworth, KS) 7 June 1997.
- Zalenik, Abraham, "The Leadership Gap," in Robert L. Taylor and William Rosenbach, eds. Military Leadership: In Pursuit of Excellence (Westview Press: Boulder, CO) 1996.
- Zsombok, Caroline, "Naturalistic Decision Making: Where Are We Now?", in Caroline Zsombok and Gary Klein, eds. in Caroline Zsombok and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J.: L. Erlbaum Associates) 1997: 3-16.
- _____, and Gary Klein, eds. Naturalistic Decision Making (Mahwah, N.J. : L. Erlbaum Associates) 1997.